

Scanned
22/2/93

Med. & Aromat. Plants Abstr. Vol. 15 No. 1 pp. 1-110

February 1993

ISSN : 0250-4367

925
22/2/93

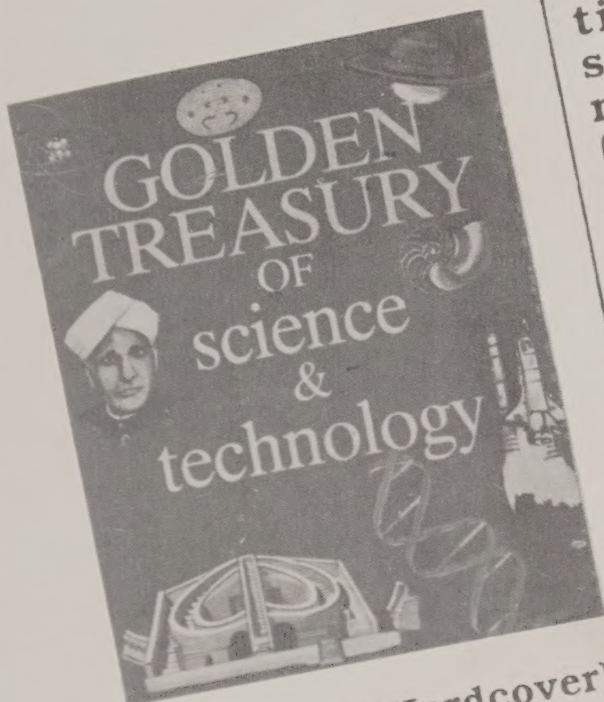
MEDICINAL & AROMATIC **PLANTS** ABSTRACTS

REPORTING CURRENT WORLD LITERATURE



PUBLICATIONS & INFORMATION DIRECTORATE, CSIR, NEW DELHI

GOLDEN TREASURY OF Science and Technology



Pages: 360 (Hardcover)
Price: Rs. 100.00
(Postage: Rs. 6.00)

This single-volume encyclopaedia not only packs between its covers an enormous amount of scientific and technological information but is also vividly illustrated, elegantly bound and reasonably priced.

Unique in its coverage of Indian science, the Treasury provides lucid explanations of scientific terms, especially selected to meet the needs of inquisitive minds. Over 3000 hand-picked entries (cross-index wherever necessary) are included in this encyclopaedia. A user-friendly appendix provides access to often sought data and information at a glance.

The Treasury would be a valuable family asset in this age of science and technology. Understanding science was never such fun.

Order with M.O./I.P.O./D.D.
made payable to
Publications & Information Directorate
may be sent to:
Sales & Distribution Officer,
Publications & Information Directorate,
Dr. K.S.Krishnan Marg,
New Delhi - 110 012.

MEDICINAL & AROMATIC PLANTS ABSTRACTS

Medicinal & Aromatic Plants Abstracts (MAPA), issued bimonthly, reports current world literature on medicinal and aromatic plants. Started in 1979 with a coverage of 272 journals, MAPA now scans some 600 journals published in 22 languages from 55 countries of the world. Each issue of MAPA in addition to carrying about 700 abstracts, includes patents and papers

member countries of Association for Science Cooperation in Asia (ASCA) for sending inputs from their respective countries for MAPA.

Collaborating Agencies: The Japanese Information Centre for Science & Technology (JICST), Tokyo. Courtesy: Mr. Takeyoshi Hanada; Thai National Documentation Centre (TNDC),

TO OUR SUBSCRIBERS

Due to continuing increase in the cost of paper, printing and other inputs we are constrained to revise the subscription rates of the following periodicals. We trust our valued subscribers would appreciate the situation and bear with us as they have done in the past.

Revised rates from April 1993 are as follows:

			Single Copy	Annual		
			Rs.	Rs.	\$	£
1.	Journal of Scientific & Industrial Research	(Monthly)	40.00	400.00	160.00	100.00
2.	Indian Journal of Chemistry, Section A	(Monthly)	50.00	500.00	200.00	120.00
3.	Indian Journal of Chemistry, Section B	(Monthly)	50.00	500.00	200.00	120.00
4.	Indian Journal of Experimental Biology	(Monthly)	50.00	500.00	200.00	120.00
5.	Indian Journal of Technology	(Monthly)	40.00	400.00	160.00	100.00
6.	Indian Journal of Pure & Applied Physics	(Monthly)	40.00	400.00	160.00	100.00
7.	Indian Journal of Biochemistry & Biophysics	(Bimonthly)	50.00	250.00	100.00	60.00
8.	Indian Journal of Radio & Space Physics	(Bimonthly)	50.00	250.00	100.00	60.00
9.	Indian Journal of Marine Sciences	(Quarterly)	60.00	200.00	80.00	50.00
10.	Indian Journal of Fibre & Textile Research	(Quarterly)	60.00	200.0	80.00	50.00
11.	Research & Industry	(Quarterly)	70.00	250.00	100.00	60.00
12.	Medicinal & Aromatic Plants Abstracts	(Bimonthly)	90.00	450.00	180.00	110.00
13.	CSIR News	(Semi-monthly)	3.00	60.00	25.00	15.00

Those enrolling as Annual Subscribers before 1.4.1993 will be entitled to pre-revised rates.

Dr Rajendra Gupta
Project Coordinator
M & A Plants
NBPGR
New Delhi 110 012

Calcutta 700 032

Dr K M Parikh
Zandu Pharmaceutical Works Ltd
Bombay 400 025

Aromatic Plants
Lucknow 226 016

Dr G P Phondke
Director, PID, Ex-officio

GOLDEN TREASURY

TO OUR SUBSCRIBERS

It is our pleasure to inform you that the Golden Treasury is now published monthly. The first issue was published in January, 1954, and has since then been a source of information and inspiration to many of our readers. We hope that you will continue to find it so.

The Golden Treasury is a publication of the National Association of Teachers in English Schools. It is published by the National Association of Teachers in English Schools, 10, St. James's Place, London, W.1.

NAME		ADDRESS	
Mr. A. B. C.	123	456	789
Mr. D. E. F.	101	202	303
Mr. G. H. I.	404	505	606
Mr. J. K. L.	707	808	909
Mr. M. N. O.	1010	1111	1212
Mr. P. Q. R.	1313	1414	1515
Mr. S. T. U.	1616	1717	1818
Mr. V. W. X.	1919	2020	2121
Mr. Y. Z. A.	2222	2323	2424
Mr. B. C. D.	2525	2626	2727
Mr. E. F. G.	2828	2929	3030
Mr. H. I. J.	3131	3232	3333
Mr. K. L. M.	3434	3535	3636
Mr. N. O. P.	3737	3838	3939
Mr. Q. R. S.	4040	4141	4242
Mr. T. U. V.	4343	4444	4545
Mr. W. X. Y.	4646	4747	4848
Mr. Z. A. B.	4949	5050	5151
Mr. C. D. E.	5252	5353	5454
Mr. F. G. H.	5555	5656	5757
Mr. I. J. K.	5858	5959	6060
Mr. L. M. N.	6161	6262	6363
Mr. O. P. Q.	6464	6565	6666
Mr. R. S. T.	6767	6868	6969
Mr. U. V. W.	7070	7171	7272
Mr. X. Y. Z.	7373	7474	7575
Mr. A. B. C.	7676	7777	7878
Mr. D. E. F.	7979	8080	8181
Mr. G. H. I.	8282	8383	8484
Mr. J. K. L.	8585	8686	8787
Mr. M. N. O.	8888	8989	9090
Mr. P. Q. R.	9191	9292	9393
Mr. S. T. U.	9494	9595	9696
Mr. V. W. X.	9797	9898	9999
Mr. Y. Z. A.	10000	10101	10202

These names are given in alphabetical order. If you have any queries, please write to the National Association of Teachers in English Schools, 10, St. James's Place, London, W.1.

MEDICINAL & AROMATIC PLANTS ABSTRACTS

Medicinal & Aromatic Plants Abstracts (MAPA), issued bimonthly, reports current world literature on medicinal and aromatic plants. Started in 1979 with a coverage of 272 journals, MAPA now scans some 600 journals published in 22 languages from 55 countries of the world. Each issue of MAPA in addition to carrying about 700 abstracts, includes patents and papers presented at the national and international seminars and symposia in the field. Recently MAPA database has been computerized.

MAPA has made significant progress within thirteen years of its existence and attracted the attention of several international agencies. Bilateral collaboration has been entered into with some

member countries of Association for Science Cooperation in Asia (ASCA) for sending inputs from their respective countries for MAPA.

Collaborating Agencies: The Japanese Information Centre for Science & Technology (JICST), Tokyo. Courtesy: Mr. Takeyoshi Hanada; Thai National Documentation Centre (TNDC), Bangkok. Courtesy: Mrs. Nongphanga Chitrakorn; and Department of Science and Industrial Research (DSIR), Wellington. Courtesy: Dr. Q.W. Ruscoe.

The journal has an International Advisory Committee and an Editorial Committee as under:

INTERNATIONAL ADVISORY COMMITTEE

Prof. Dr K Hüsni Can Baser
Medicinal Plants Research Centre
Anadolu University
Eskisehir
Turkey

Prof. (Dr) J G Bruhn
Swedish Academy of Pharmaceutical Sciences
Stockholm, Sweden

Dr H M Chang
Chinese University of Hong Kong
Hong Kong

Prof. N R Farnsworth
University of Illinois
Chicago, USA

Prof. G M Hocking
Auburn University
Alabama, USA

Prof. S V Kessar
Department of Chemistry
Panjab University
Chandigarh 160 014

Dr B M Lawrence
R.J. Reynolds Tobacco Co.
Winston-Salem, NC, USA

Prof. Xiao Pei-Gen
Institute of Medicinal Plant Development
Beijing, China

Dr J D Phillipson
School of Pharmacy
University of London
London, UK

Prof. (Dr) E Reinhard
Pharmazeutisches Institut der Universität Auf
der Morgenstelle 8
Tubingen, Germany

Prof. A Ruminska
University of Agriculture
Warszawa, Poland

Dr R Verpoorte
Centre for Bio-Pharmaceutical Sciences
University of Leiden
Leiden, The Netherlands

Prof. H Wagner
Institute of Pharmaceutical Biology
University of Munich
Munich, Germany

Dr G P Phondke
Director, PID, Ex-officio

EDITORIAL COMMITTEE

Prof. Ms Sharadini Dahanukar
Seth G.S. Medical College
Bombay 400 012

Dr B N Dhawan
Director
Central Drug Research Institute
Lucknow 226 001

Dr Rajendra Gupta
Project Coordinator
M & A Plants
NBPGR
New Delhi 110 012

Dr R S Kapil
Director
Regional Research Laboratory
Jammu-Tawi 180 001

Dr S C Pakrashi
CSIR Distinguished Fellow
Indian Institute of Chemical Biology
Calcutta 700 032

Dr K M Parikh
Zandu Pharmaceutical Works Ltd
Bombay 400 025

Dr G V Satyavati
Senior Deputy Director General
Indian Council of Medical Research
New Delhi 110 029

Dr R S Thakur
Director
Central Institute of Medicinal and
Aromatic Plants
Lucknow 226 016

Dr G P Phondke
Director, PID, Ex-officio

MEDICINAL & AROMATIC PLANTS INFORMATION SERVICE (MAPIS)

Medicinal and Aromatic Plants Information Service (MAPIS), started in 1976 at PID, offers the following services:

- *Current Awareness Service*—provides information on medicinal and aromatic plants through a bimonthly, *Medicinal & Aromatic Plants Abstracts* (MAPA). For subscription rates see contents page.

- *Selective Dissemination of Information*—will provide, when operational, computerized printout of current titles with abstracts of papers on medicinal and aromatic plants.

- *Technical Enquiry Service*—furnishes information relating to botanical nomenclature, regional names, cultivation methods, chemical constituents, pharmacological properties, uses, etc. Charges per page Rs.10/- for scientists and Rs. 20/- for private entrepreneurs.

- *Bibliography Service*—provides references (retrospective and current) on any aspect of the medicinal and aromatic plants. Charges per page Rs.10/- for scientists and Rs.20/- for private entrepreneurs.

- *Statistical Service*—supplies data regarding production, marketing and trade, import and export of the medicinal and aromatic plants. Charges same as for Technical Enquiry Service.

- *Document Copy Service*—furnishes photocopies of journal articles cited in MAPA @ Re. 1 - per page. Photocopies of the journal articles not available at PID library (as indicated at the end of each abstract) can be obtained by writing to 'Scientist-in-Charge, INSDOC, 14 Satsang Vihar Marg, New Delhi 110067.

All payments should be made in advance by IPO/draft/cheque payable in favour of Publications & Information Directorate (MAPIS).

For details, contact

The Head

Technical Information Services Division

Publications & Information Directorate, CSIR

Dr. K.S. Krishnan Marg, New Delhi 110 012

ACKNOWLEDGEMENTS

The cooperation of the following libraries, located at New Delhi, in allowing the use of their holdings is gratefully acknowledged: National Science Library, National Medical Library, and Libraries of the Indian Agricultural Research Institute, National Physical Laboratory, Delhi University, Indian National Science Academy and World Health Organization (Reg. Office for S.E. Asia).

EDITORIAL STAFF

Editors

H C Jain
S P Mehta (Mrs)
Dr Gian Singh
Dr R Doreswamy
Dr T K Mukherjee

Assistant Editor

Dr Darshan Sharma (Mrs)

Computer Processing

Dr Chander Shekhar

Editor-in-Chief

Dr G P Phondke

Annual Subscription

Rs 300.00 \$ 125.00 £ 75.00

Single Copy

Rs 60.00 \$ 25.00 £ 15.00

50% discount admissible to research workers and students and 25% discount to non-research individuals, on annual subscription

Subscription may be drawn by cheque/bank draft in favour of

Publications & Information Directorate
and sent to:

The Senior Sales & Distribution Officer
Publications & Information Directorate
Dr. K.S. Krishnan Marg
New Delhi 110 012, India

Please add bank charges (Rs 10.00) for outstation cheques in India and for foreign cheques please add \$ 2.00 or £ 1.00

Published by the Publications &
Information Directorate, CSIR,
Dr. K.S. Krishnan Marg, New Delhi 110 012, India

© 1993 The Council of Scientific & Industrial
Research, New Delhi, India

Medicinal & Aromatic Plants Abstracts

VOLUME 15 NO.1 FEBRUARY 1993

Contents

Agronomy	1
Botany (General & Systematic)	4
Breeding & Genetics	4
Diseases & Pests	7
Physiology & Biochemistry	8
Pharmacognosy	18
Clinical Studies	22
Pharmacology & Toxicology	24
Antimicrobial Activity	38
Insecticidal & Piscicidal Activity	41
Phytochemistry	43
Chemotaxonomy	75
Ethnomedicine	78
Analytical & Processing Techniques	82
Miscellaneous	87
New Publications	93
Patents	96
List of Serials Abstracted	99
Botanical Names Index	103

Every effort is made to present the abstracts accurately but MAPA assumes no liability for any errors and omissions.

Medicinal & Aromatic Plants Abstracts

Agronomy

9301-0001 Avtar Singh, Mahey, R.K. (Department of Agronomy, Punjab Agricultural University, Ludhiana 141 004, Punjab, India) **Fertiliser use in Umbelliferae.** *Fertiliser News*, v. 37(10): p. 39-45, 1992 (40 ref, Eng).

Use of fertiliser in medicinal and aromatic plants of family Umbelliferae *Coriandrum sativum*, *Cuminum cyminum*, *Carum carvi*, *Anethum graveolens*, *Apium graveolens*, *Foeniculum vulgare*, *Ammi majus*, *Pimpinella anisum* and *Trachyspermum ammi* has been reviewed. Export of spices and spice oils from India during 1983-1988 has been discussed.

9301-0002 Bopaiah, B.M., Shantaram, M.V. (Central Plantation Crops Research Institute, Kasaragod 671 124, Kerala, India) **Influence of season and drying temperature on the quality of cocoa beans.** *Indian Cocoa, Arecanut and Spices Journal*, v. 15(2): p. 37-39, 1991 (14 ref, Eng).

Fermentation and drying are essential to develop flavour and aroma precursors in *Theobroma cacao*. The changes in temperature and pH during fermentation and the quality of cocoa beans in dry and wet seasons have been reported. Sun drying was found to be superior in quality with respect to acidity (pH). The beans were smaller in size with higher shell content and lower pH in wet season as compared to the bigger beans, low shell content and higher pH in dry season.

9301-0003 Fukuda, T., Aragane, M., Yoshizawa, M., Suzuki, Y., Aragane, M., Tanaka, H. (Tokyo Metropolitan Medicinal Plant Garden, Nakajima-cho 21-1, Kodaira, Tokyo 187, Japan) **Studies of cultivation of *Atractylodes ovata*. I. some aspects of seed production.** *Shoyakugaku Zasshi*, v. 46(3): p. 240-245, 1992 (5 ref, Eng, Jap).

The cultivation method of *A.ovata* by using seed propagation was established. *A.ovata* produced enough seeds for the propagation of the plant by seeding, the seed production was, however, closely related to the flowering phenology, and the seed production of the 1 year old plants was less than that of the 2 year old plants, because the flowering period of the 1 year old plants was one month later than of the 2 year old plants. It was found that, when isolated from any pollinator during the flowering period, *A.ovata* produced only a few seeds, and that, however, when artificial pollination was performed, the isolated *A.ovata* produced many seeds. The results strongly suggest that *A.ovata* requires cross fertilization.

9301-0004 Gupta, R., Mukherji, K.G. (Department of Botany, University of Delhi, South Campus, Benito Juarez Road, New Delhi 110 021, India) **Effect of direct incorporation of *Corchorus olitorius* leaf litter and its fungal decomposers on productivity of *Trigonella foenum-graecum*.** *Bionature*, v. 12(1&2): p. 23-27, 1992 (16 ref, Eng).

Direct incorporation of leaf litter of *C.olitorius* along with selected fungi *Chaetomium bostrychodes* and *Trichoderma viride* increased the biomass of *T.foenum-graecum* but nitrogen uptake and productivity remained statistically unchanged. Addition of leaf litter with or without fungi resulted in five time increase in nitrogen content of leaves, which was equivalent to organic manure treatments. NSL, New Delhi.

9301-0005 Jayachandran, B.K., Meera Bai, M., Abdul Salem, M., Mammen, M.K., Mathew, K.P. (NARP(SS), Kottarakkara 691 506, Kerala, India) **Performance of ginger under shade and open conditions.** *Indian Cocoa, Arecanut and Spices Journal*, v. 15(2): p. 40-41, 1991 (4 ref, Eng).

The yield of *Zingiber officinale* Cv. Rio-de-Janeiro under 50 percent shade was found to be nearly comparable to that cultivated in open conditions. Shade intensity beyond 50 percent decreased the yield. Cultivation of this cultivar for homestead and intercropping under coconut and other perennial crops has been recommended.

9301-0006 Krishnamoorthy, B., Azchariah, T.J. (National Research Centre for Spices, Marikunmm, Calicut 673 012, Kerala, India) **Drying black pepper on polyethylene materials.** *Indian Cocoa, Arecanut and Spices Journal*, v. 15(3): p. 75, 1992 (Eng).

Advantage of *Piper nigrum* drying on polyethylene materials over the traditional methods has been discussed.

9301-0007 Martin, P.J., Rashid, A.A., Cribb, J., Poultney, R.* (Statistics Department, AFRC Institute of Arable Crops Research, Rothamsted Experimental Station, Harpenden AL5 2JQ, UK) **Survival and growth of clove seedlings in *Zingiber*. 2. Effects of nursery practices and mulching.** *Tropical Agriculture(Trinidad)*, v. 69(4): p. 374-380, 1992 (13 ref, Eng).

In the first year after planting on-farm trials, clove (*Syzygium aromaticum*) seedlings which had been grown in the nursery in polythene bags showed marginally better survival and larger increases in height than normal nursery seedlings lifted by chiselling. Seedlings which were lifted by coring showed no consistently better survival or growth

than chiselled seedlings and coreing was a more labour-intensive method. Overall, mulching seedlings in the field with coconut husk caused larger improvements in seedling survival than raising them in polythene bags or coreing them at lifting. Under Research Station conditions, seedlings raised in polythene bags and watered daily in the nursery, survived significantly better in the field and showed larger increases in height across a range of treatments than chiselled seedlings. In the same experiment, seedling survival was not improved by planting a cassava shade crop before, rather than at the same time as the cloves, nor by mulching with coconut husk; a mulch of weeds decreased seedling survival.

9301-0008 Martin, P.J., Poultney, R.* (Statistics Department, AFRC Institute of Arable Crops Research, Rothamsted Experimental Station, Harpenden, Herts AL5 2JQ, UK) **Survival and growth of clove seedlings in Zanzibar. 1. Effects of mulching and shade crops.** *Tropical Agriculture (Trinidad)*, v. 69(4): p. 365-373, 1992 (25 ref, Eng).

Clove (*Syzygium aromaticum*) seedling mortality in the field was highest during the two dry seasons of the first year after planting. Survival after planting and growth in the first few years in the field were significantly improved by mulching. A coconut husk mulch was more effective than the previously recommended mulch of banana pseudostems. Seedling survival was also significantly increased by the use of banana or cassava shade crops. In a comparison of clove seedling survival amongst grass, kudzu, bananas and cassava, Cassava resulted in significantly better clove seedling survival and growth than the other plants.

9301-0009 Menon, R., Nair, S. (Kerala Agricultural University, Vellanikkara, Trichur, Kerala, India) **Softwood grafting clove (*Syzygium aromaticum* L.) plants.** *South Indian Horticulture*, v. 40(1): p. 62-63, 1992 (6 ref, Eng).

Softwood grafting using scion shoot with leaves and provided with a humid cap gave 33 percent success and 30 percent survival after one year. The retention of the cotyledon by the root stock seedling has been reported as an important factor determining the success.

9301-0010 Moore, R.M., Williams, J.D.* , Nicholls, A.O. (Division of Plant Industry, CSIRO, GPO Box 1600, Canberra, ACT 2601, Australia) **Competition between *Trifolium subterraneum* L. and established seedlings of *Hypericum perforatum* L. var. *angustifolium* DC.** *Australian Journal of Agricultural Research*, v. 40(5): p. 1015-1025, 1989 (17 ref, Eng).

In monocultures maximum dry matter yields of *H. perforatum* after 188 days were half those of *T. subter-*

raneum at similar densities. Leaf areas of the two species were similar at all harvests. In mixtures, a single *T. subterraneum* plant completely suppressed *H. perforatum* growth and caused extensive mortality, even at its highest density 16 plants per pot within 140 days, the period of experiment. Increasing the numbers of *H. perforatum* plants in mixtures had little effect on the growth of a single *T. subterraneum*. Final yields of *T. subterraneum* in such mixtures were similar to those of comparable densities in monocultures. The application of these findings to agronomic practices designed to prevent re-establishment of *H. perforatum* is discussed.

9301-0011 Munshi, A.M., Zargar, G.H. (Department of Plant Breeding and Genetics, S K University of Agriculture, Science & Technology, Srinagar, JK, India) **A brief note on the performance of some hops varieties in Kashmir.** *Indian Cocoa, Arecanut and Spices Journal*, v. 15(3): p. 78, 1992 (Eng).

The relative performance, in terms of yield per hectare, average composition of essential oil contents and other floral characteristics of several exotic varieties of *Humulus lupulus* have been discussed.

9301-0012 Nueuninger, H., Saukel, J.* , Witzmann, J. (Institut für Pharmakognosie der Universität Wien, Wahringer Strasse 25, A-1090 Wien, Österreich) **The THC-content of Cannabis plants cultivated in Australia. The influence of the harvest-period and weather.** *Scientia Pharmaceutica*, v. 60(1-2): p. 105-109, 1992 (13 ref, Eng).

The THC-content of *C. sativa*, cultivated in Vienna from seed material of subtropical origin, is about 46 percent higher when harvested in November than October. The THC-contents of seventeen samples of *Cannabis* secured in Austria are slightly correlated with the date of harvesting too.

9301-0013 Pal, M., Badola, K.C., Bhandari, H.C.S. (Plant Physiology Discipline, Forest Research Institute, Dehra Dun 248 006, UP, India) **Stimulation of adventitious root regeneration on leafy shoot cuttings of neem (*Azadirachta indica*) by auxin and phenols.** *Indian Journal of Forestry*, v. 15(1): p. 68-70, 1992 (10 ref, Eng).

Effect of indole butyric acid, 1-naphthol, 2-naphthol, carbolic acid and salicylic acid on the rooting soft-wood branch cuttings, and of indole butyric acid and 1-naphthyl acetic acid on rooting of semi-hard wood branch cuttings of neem is reported. Auxin treated as well as untreated control semi-hardwood cuttings failed to root. About 30 percent of the leafy soft-wood cuttings rooted even without any chemical treatment. Indole butyric acid as well as the phenols, when applied alone, stimulated adventitious root regenera-

tion on the cuttings. Combination of IBA with the phenols inhibited rooting. The findings indicate that indole butyric acid and phenols can be utilized for improving rooting of shoot cuttings to raise clonal plantations of neem.

9301-0014 Pareek, S.K., Maheshwari, M.L., Gupta, R. (National Bureau of Plant Genetic Resources, Pusa, New Delhi-110012, India) **It pays to grow 'hybrid 8' vetiver.** *Indian Farming*, v. 41(2): p. 8-10, 1992 (A20, Eng).

Land preparation and planting; fertilizers; irrigation and interculture; diseases and pests; harvesting and; distillation, yield and economics of cultivation of *Vetiveria zizanioides* 'hybrid 8' have been described. Vetiver does well in regions where the temperature ranges from 30 degree C to 40 degree C and the annual rainfall from 50 to 200 cum. 'Hybrid 8' withstands soil salinity (pH9) if it is given frequent irrigations during initial 2 months after the end of the monsoon. The net profit is Rs 18,000/ha in 15 months.

9301-0015 Rajamani, K., Thamburaj, S., Thangaraj, T., Murugesan, S. (Horticultural Research Station, Yercand 636 602, Sale-District, TN, India) **Studies on the effect of certain herbicides in rose Cv 'Happiness'.** *South Indian Horticulture*, v. 40(2): p. 121-122, 1992 (2 ref, Eng).

The effect of weed population had remarkable effect on the rose plant height. Oxyfluorfen at 1.0 kg a.i./ha recorded the highest plant height of 56.19 cm which was on par with Diuron 2.5 kg a.i./kg (51.27cm) and simaxine 3kg a.i./ha (49.31cm). There was no significant difference between the treatments and the flower yield. None of the treatments exhibited any phytotoxic symptoms on the rose plants.

9301-0016 Ram, G., Patel, J.K., Chaure, N.K. (Indira Gandhi Krishi Vishwa Vidyalaya, Regional Agricultural Research Station, Sarkanda, Bilaspur, 495001, MP, India) **Effect of Azospirillum, FYM and chemical fertilizer on rainfed niger.** *Advances in Plant Sciences*, v. 5 (special issue): p. 249-252, 1992 (4 ref, Eng).

Azospirillum and FYM increased seed yield of niger *Guizotia abyssinica* by 34 percent and 65 percent over control, respectively. When Azospirillum + Chemical fertilizer was combined it gave 63 percent increased yield over the control. Organic carbon increased due to treatments while soil pH decreased. Available nitrogen significantly increased by the FYM, Azospirillum alone or with chemical fertilizer, over that of control.

9301-0017 Rao, M.P., Shareef, S.M., Raju, V.T. (Department of Agricultural Economics, Agricultural College, Bapala 522101, AP, India) **Costs and return of jasmine**

cultivation in Guntur district of Andhra Pradesh. *South Indian Horticulture*, v. 40(2): p. 100-104, 1992 (Eng).

The cost of cultivation of *Jasminum sambac* varied from Rs 31512.47/ha in 1-3 years of flowering age group to Rs 34829.40/ha in the case of 9 and above 9 years age group. The costs and returns of jasmine in different age groups have been worked out. Production statistics of jasmine in India are given.

9301-0018 Rawat, A.S., Pharswan, A.S., Nautiyal, M.C. (High Altitude Plant Physiology Research Centre, H.N.B. Garhwal University, Srinagar, Garhwal, India) **Propagation of Aconitum atrox (Bruhl), Muk. (Ranunculaceae), a regionally threatened medicinal herb.** *Economic Botany*, v. 46(3): p. 337-338, 1992 (2 ref, Eng).

Feasibility of vegetative propagation of root-tuber segments obtained from a natural population of mature plants obtained from Kedarnath area, was undertaken. The results reveal that the tuber segmentation method can be adopted for multiplication of *A.atrox*. Since, raising the exploitable crop from seeds is a lengthy process (5 yr cycle), growing the crop through tuber segmentation method seems to be advantageous.

9301-0019 Reddy, B.N., Sivaraman, K., Sadanandan, A.K. (National Research Centre for Spices, Calicut 673 012, Kerala, India) **"High plant density" approach to boost black pepper production.** *Indian Cocoa, Arecanut and Spices Journal*, v. 15(2): p. 35-36, 1991 (Eng).

Yield performance of *Piper nigrum* with high plant density approach through adjustment in plant spacing with three varieties viz., Panniyur-1, Karimunda and Aimpiriyan has been reported. The close spacing of 2 X 1m @ 5000 plants/ha proved to be significantly superior to all other spacings. The yield performance of pepper varieties revealed no significant differences over the years although the variety Karimunda proved superior to others.

9301-0020 Sahu, S.K., Mitra, G.N. (Department of Soil and Agricultural Chemistry, O U A T., Bhubaneswar 751 003, Orissa, India) **Influence of physico-chemical properties of soil on yield of ginger and turmeric.** *Fertiliser News*, v. 37(10): p. 59-63, 1992 (6 ref, Eng).

Influence of soil types, soil texture, soil pH and soil fertility on yield of *Zingiber officinale* and *Curcuma longa* in Orissa has been reviewed. Yields of different ginger and turmeric cultivars under different textural classes of soils in Orissa have been tabulated. Effect of application of lime and graded levels of nitrogen on the yield of these two crops has also been discussed.

Botany (General & Systematic)

9301-0021 Anna Mani, B., Prabhakar, M. (Department of Botany, Osmania University, Hyderabad 500 007, AP, India) **Foliar architecture of some medicinal plants (Celastrales).** *Asian Journal of Plant Science*, v. 3(1): p. 17-21, 1991 (15 ref, Eng).

The venation patterns recorded are pinnately camptobrochidodromous, brochido-craspedodromous, craspedodromous and palmatous acrodromous. The foliar architecture is found to be of taxonomic importance key has been provided which can be used in identification of leaf drugs of celasterales.

9301-0022 Konoshima, M. (Kyoto University and Hokkaido Institute of Pharmaceutical Sciences, Japan) **Topographical view on Chinese crude drugs - Modern topography of Chinese crude drugs-(Part III).** *Shoyakugaku Zasshi*, v. 46(2): p. 77-97, 1992 (Eng).

Only title translated.

9301-0023 Lebel, L.A., Ramanujam, M.P., Ambalanathan, B. (Department of Botany, Centre for Postgraduate Studies, Pondicherry 605 008, India) **Efficacy of some roadside plants as dust filters.** *Geobios*, v. 19(4): p. 143-146, 1992 (9 ref, Eng).

Of four roadside plants tested for their dust gathering capacity under natural pollution loads in five different roads of Pondicherry town, *Nerium odorum* and *Psidium guajava* were found to be the best dust gatherers.

9301-0024 Negi, P.S. (Computer Data Centre, D M Office, Pauri, UP, India) **Economic forest resources of Garhwal-Kumaun Himalaya.** *Indian Forester*, v. 118(8): p. 583-593, 1992 (3 ref, Eng).

The economic forest resources of the Garhwal-Kumaun Himalaya explored with special reference to medicinal and other economic plants has been discussed.

9301-0025 Sacco, T., Peracino, V., Maffei, M. (Department of Morphophysiology and Botany, University of Turin Viale P.A. Mattioli 25, 10125 Turin, Italy) **Phenotypic plasticity in *Mentha viridis* *lavanduliodora*.** *Journal of Essential Oil Research*, v. 4(5): p. 491-496, 1992 (14 ref, Eng).

The results of the study reveal that the variation in linalool content of *M. viridis* cult. *lavanduliodora* F1 hybrids appears to be strictly dependent on genotype, as shown by the high levels of genotypic variation found for this compound. On the other hand, linalyl acetate variation appears to be more influenced by environmental changes

than genotype, thereby demonstrating a high degree of phenotypic plasticity.

9301-0026 Salgare, S.A., Swain, S. (Department of Botany, Institute of Science, Bombay 400032, Maharashtra, India) **Effect of auto-exhaust pollution at western express highway near National park Borivili (East), on the micro morphology of some weeds ('Harvest')-I.** *Biosphere*, v. 3(1): p. 8-18, 1991 (9 ref, Eng).

Effect of auto exhaust pollution, on the morphology of *Cassia tora*, *Xanthium strumarium* and *Malachra capitata* was studied on different parameters of 5th leaf. The parameters like number of stomata and epidermal cells per unit and stomatal index exhibited stimulation whereas length, breadth and Calculated area of stomata showed inhibition. NSL, New Delhi.

9301-0027 Schilling, E.E., Ma, Q.S., Anderson, R.N. (Department of Botany, University of Tennessee Knoxville 37996-1100, USA) **Common names and species identification in Black Night Shades, *Solanum* sect. *Solanum* (Solanaceae).** *Economic Botany*, v. 46(2): p. 223-225, 1992 (17 ref, Eng).

This report brings to the attention of ethnobotanical workers key aspects of the current taxonomy for the black nightshades through a review of published literature, as well as to communicate information on the common names for members of the group *Solanum* sect. *Solanum* described in India, Pakistan and China.

9301-0028 Suresh Baburaj, D., Nain, S.S., Rajan, S. (Survey of Medicinal Plants and Collection Unit, Udhayogmandalam 643 002, TN, India) **Teratological observations on three flowering plants.** *Journal of Economic and Taxonomic Botany*, v. 15(1): p. 227-232, 1991 (9 ref, Eng).

Abnormalities and variations in vegetative parts of *Pongamia pinnata* and essential organs of *Trifolium repens* and *Phytolacca octandra* have been reported.

Breeding & Genetics

9301-0029 Arora, R.N., Lodhi, G.P., Mehta, S.L. (Haryana Agricultural University, Hissar, Haryana, India) **Studies on the genetic variability, correlation and path-analysis for some qualitative and quantitative characters in fenugreek germplasm.** *Indian Journal of Plant Genetic Resources*, v. 2(2): p. 131-135, 1989 (6 ref, Eng).

Eighty eight indigenous and exotic germplasm accessions of fenugreek (*Trigonella foenum-graecum*) maintained at HAU were evaluated for qualitative and quantitative attributes of grain yield. Considerable variability was present for component characters like plant height,

branches, clusters, pods per plant, pod length, seeds per pod and days to maturity. These were correlated with grain yield and clusters per plant, plant height, pod length and 100 seed weight. A few lines namely MFM 39,65,78,187,193 and IL 356 were better in seed yield and can be used in breeding programmes to develop ideal plant types in fenugreek.

9301-0030 Avatar, R., Sharma, R.K., Sastry, E.V.D., Dashora, S.L. (Department of Genetics and Plant Breeding, SKN College of Agriculture, Jobner 303 329, Rajasthan, India) **Variation and character association in cumin.** *Indian Cocoa, Arecanut and Spices Journal*, v. 15(2): p. 45-47, 1991 (4 ref, Eng).

A collection of 30 entries of *Cuminum cyminum* showed significant variability for wilt incidence, powdery mildew, days to flowering, days to maturity, plant height, primary branches per plant, umbels per plant, umbellets per umbel, grains per umbel, grain yield per five plant, harvest index, test weight and grain yield per plot. The estimate of heritability was high for grain yield per five plant, days to flowering, days to maturity, primary branches per plant and umbels per plant. Grain yield per plot had positive and significant correlation with plant height, umbellets per umbel and primary branches per plant, while it exhibited negative and significant association with wilt incidence.

9301-0031 Bracher, D., Kutchan, T.M. (Lehrstuhl für Pharmazeutische Biologie, Universität München, Karlstrasse 29, W-8000 München 2, FRG) **Polymerase chain reaction comparison of the gene for strickosidine synthase from ten *Rauvolfia* species.** *Plant Cell Reports*, v. 11(4): p. 179-182, 1992 (12 ref, Eng).

The gene for strictosidine synthase, str 1, was analysed by the polymerase chain reaction in ten species of *Rauvolfia*. Restriction endonuclease analysis of the gene fragments produced with genomic DNA from each of the ten tropical species as template revealed that str 1 as highly conserved in *Rauvolfia* species investigated. A stringent selection pressure on the gene for this key enzyme of indole alkaloid biosynthesis has been suggested. IARI, New Delhi.

9301-0032 Chhabra, A.K., Hooda, J.S., Sharma, G.D. (Department of Plant Breeding, Haryana Agricultural University, Hissar 125004, Haryana, India) **Use of semi-graphical technique for classification of isabgol germplasm.** *Indian Journal of Plant Genetic Resources*, v. 3(1): p. 76-80, 1990 (3 ref, Eng).

Sixty one (5 exotic) accessions of isabgol (*Plantago ovata*) were introduced and classified based on semi-graphical technique. Genetic diversity proved to be more important than geographical diversity. On the basis of index score values and ray patterns of different traits, promising

genotypes were identified for use in heterosis and breeding programmes. Some accession groups did not contain any genotype.

9301-0033 Giridharan, M.P., Balakrishnan, S. (College of Horticulture, Vellanikkara 680 654, Trichur, Kerala, India) **Gamma ray induced variability in vegetative and floral characters of ginger.** *Indian Cocoa, Arecanut and Spices Journal*, v. 15(3): p. 68-72, 1992 (21 ref, Eng).

Irradiation treatments produced inhibitory effects on sprouting of ginger rhizomes. The plant height, tiller production, leaf production and leaf area decreased with the increase in irradiation dosages. Flowering behaviours of ginger could not be altered by the levels of gamma irradiation tried.

9301-0034 Gupta, R. (NBPGR, Pusa Campus, New Delhi 110012, India) **Untapped tropical fruit plants industry and their improvement.** *Indian Journal of Plant Genetic Resources*, v. 3(2): p. 97-104, 1990 (10 ref, Eng).

A list of lesser known tropical fruit plants of India along with distribution and uses is drawn from literature to generate research in their genetic utilization. These fruit plants have not received enough research support. For this, exploitation of genetic variability occurring in natural populations and selective breeding is required to improve their yield and quality for drugs and allied industries.

9301-0035 Gupta, R. (National Bureau of Plant Genetic Resources, New Delhi 110 012, India) **Genetic resources of medicinal plants.** *Indian Journal of Plant Genetic Resources*, v. 1(1/2): p. 98-102, 1992 (7 ref, Eng).

About 35 threatened medicinal plants are extensively collected from the wild growing populations. The current programme on collection, evaluation and domestication of the plants in India under ICAR are highlighted. The need to develop a network of collaborative institutions to hasten the domestication of superior types suited to different agricultural and agroforestry systems is also indicated.

9301-0036 Hegde, B.A., Lugade, M.R. (Department of Botany, Shivaji University, Kolhapur 416004, Maharashtra, India) **Karyological and meiotic peculiarities in tetraploid *Gloriosa* Loud. ($2n=4x=44$).** *Advances in Plant Sciences*, v. 5(special issue): p. 379-385, 1992 (10 ref, Eng).

Karyological and meiotic studies that were carried out in the tetraploid species of *G. plantii* revealed that somatic number $2n=4x=44$ chromosomes. This taxon having oblong wavy perianth is morphologically distinct, with the flower colour straw yellow at the base and vermilion at the top, and has red carmine seeds. The highly irregular meiosis with first and second division stages exhibiting large number of

laggards and formation of multivalents in the first division, support its tetraploid tendency.

9301-0037 Kumar, N., Thamburaj, S., Pugalandhi, L., Mohideen, M.K. (Horticultural Research Station, Yercaud 638602, Salem District, AP, India) **Note on the variability in the early vigour of certain black pepper varieties.** *South Indian Horticulture*, v. 40(2): p. 118-120, 1992 (2 ref, Eng).

Out of the three growth characters investigated in 48 different varieties of *Piper nigrum* the number of leaves per vine showed high degree of variability followed by vine length and number of nodes per vine.

9301-0038 Menon, R., Valsala, P.A., Nair, G.S. (Kerala Agricultural University, Vellanikkara 680654, Kerala, India) **Evaluation of open pollinated progenies of turmeric.** *South Indian Horticulture*, v. 40(2): p. 90-92, 1992 (4 ref, Eng).

In a study on the evaluation of 39 open pollinated progenies of *Curcuma longa* variety Nandyal, the results revealed significant differences among progenies in respect of all plant characters (except the number of tillers per plant), rhizome characters, yield, curing percentage and curcumin content. Curcumin content ranged from 2.1 to 5.1 percent, while the parental type yielded 3.0 percent. The line-N-47 exhibited superiority over the parental line in respect of yield (8.7 kg), curing percentage (18 percent) and curcumin content (4.8 percent). There is a scope for selection from among the seedling progenies for different economic characters in turmeric.

9301-0039 Mohanty, D.C., Naik, B.S., Dash, D.K., Sharma, Y.N., Panda, B.S. (HARS, Orissa University of Agricultural and Technology, Pottangi 764039, Koraput, Orissa, India) **Genetic resources and their evaluation in ginger.** *Indian Journal of Plant Genetic Resources*, v. 3(1): p. 41-45, 1990 (12 ref, Eng).

An attempt has been made to provide useful information on evaluation and classification of ginger (*Zingiber officinale*) germplasm collected from Eastern Ghat High Land Zone of Orissa. 124 accessions were evaluated in a phased manner and useful accessions were identified and results are presented.

9301-0040 Pandey, G., Sharma, B.D., Hore, D.K. (NBPGR, Regional Station, Shillong 793013, Meghalaya, India) **Meteroglyph and index score analysis of turmeric germplasm in north eastern region of India.** *Indian Journal of Plant Genetic Resources*, v. 3(2): p. 56-66, 1990 (1 ref, Eng).

Twenty three genotypes of turmeric (*Curcuma longa*) were evaluated. BD-7-105 (18), DKH-26(B), AH6/2(12) and BD-17(8) were among five top ranking genotypes for six characters. Four morphological complexes were recognised on the basis of total yield per plant and weight of primary rhizomes. Within group, morphological variations were of low order. Majority of the high scoring genotypes were in group III or IV characterized by high yield.

9301-0041 Pathak, R.K., Hari OM, Dwivedi, R. (Narendra Dev University of Agriculture and Technology, Faizabad, UP, India) **Collection, maintenance and evaluation of anola (*Emblca officinalis* Gaertn.) germplasm.** *Indian Journal of Plant Genetic Resources*, v. 1(2): p. 84-86, 1989 (4 ref, Eng).

Seedlings variation in the material available in the major anola *E. officinalis* growing tract of Pratapgarh district were critically surveyed and few promising ones identified. These seedling variations, along with those of well known cultivars were grouped on the basis of season of maturity, fruit size and bearing potential.

9301-0042 Pratibha Devi, Kiranmai, V., Janaki Kumari, Padmavathi, T. (Department of Botany, Osmania University College for Women, Kothi, Hyderabad 500 001, AP, India) **Gamma irradiation in *Pimpinella anisum* L..** *Advances in Plant Sciences*, v. 5(special issue): p. 283-289, 1992 (27 ref, Eng).

The effects of gamma rays on certain parameters(R1) of *P. anisum* are presented. Seeds were exposed to gamma rays with the dosage ranging from 10 to 50 KR. The R1 generation was studied for the following parameters; germination percentage, plant height, number of branches on the main stem, days to maturity and the number of seeds per umbel. An increase in value was observed for all parameters at the lower dosages of irradiation. However a decrease in values was observed at higher doses of 30-50 KR.

9301-0043 Sankaranarayanan, R., Muthusamy, S., Abdulkhader, Md. (Tamil Nadu Agricultural University, Coimbatore 641003, TN, India) **Variability studies in senna.** *South Indian Horticulture*, v. 40(2): p. 93-95, 1992 (5 ref, Eng).

Number of branches, length of leaves, number of leaves per plant, leaf yield at 90 days, sennoside content of leaves at 90 days and sennoside content of pods at 25 days showed significant positive correlation with leaf yield in *Cassia angustifolia*. The pod yield was significantly correlated with plant height, number of branches, length of recomes, number of pods set per spike at 100 days, length

of pods, yield of pods at 25 days and sennoside content of pods at 25 days.

9301-0044 Sethi, K.L., Maheshwari, M.L. , Srivastava, V.K. (National Bureau of Plant Genetic Resources, New Delhi, India) **Variability in genetic resources of vetiver.** *Indian Journal of Plant Genetic Resources*, v. 2(1): p. 87-88, 1989 (Eng).

Twenty two genetic stocks of vetiver, *Vetiveria zizanioides* collected from Bharatpur were planted in 5 rows plots during 1984. Data on growth and main characters like stem number per plant, oil content, aroma characteristics etc were recorded after 18 months of planting and results are discussed and reported.

9301-0045 Singh, B.P., Deepchand, Singh, R.V. , Saxena, R.K. (National Bureau of Plant Genetic Resources, New Delhi, India) **Introduction and collection of plant genetic resources of medicinal and aromatic plants and their utilization.** *Indian Journal of Plant Genetic Resources*, v. 2(1): p. 91-94, 1989 (11 ref, Eng).

Germplasm of 1160 acc in 96 genera and 275 species of different medicinal and aromatic plants, collected from different countries were introduced. The collections made by NBPGR were used by several institutions and universities all over India. Several promising genotypes, identified and released for primary introductions have been enumerated. Some of them are EC 17250(USA) of *Artemisia annua*, EC 138836-37(Malawi) of *Chrysanthemum cinerariifolium*, EC 939 28(Germany) of *Hyoscyamus muticus*, EC 41911(USSR) of *Mentha piperita*.

9301-0046 Srivastava, V.K., Singh, B.M. , Gupta, V., Chaudhari, N.K., Gupta, R.(NBPGR, Pusa Campus, New Delhi 110012, India) **Variability in Indian Aloe.** *Indian Journal of Plant Genetic Resources*, v. 3(2): p. 93-96, 1990 (6 ref, Eng).

Forty four populations of Indian *Aloe* were evaluated for agrobotanical characters and aloin content. Analysis showed that aloin content was positively correlated with short, broad and thick leaves. 8 Promising lines were identified for comparative evaluation and domestication. A chemical test has shown that 13 lines were showing Klunge negative test suggesting a need for further taxonomic validation of Indian material under *Aloe barbadensis*.

9301-0047 Yuba, A., Honda, G., Mizukoshi, T. , Tabata, M.(Faculty of Pharmaceutical Sciences, Kyoto University, Yoshida-shimoadachi-cho, Sakyo-ku, Kyoto 606, Japan) **Organ-specific expression of a genetic factor inducing monoterpenes synthesis in the calyx of *Perilla frutescens*.**

Shoyakugaku Zasshi, v. 46(3): p. 257-260, 1992 (5 ref, Jap, Eng).

The leaves of *P. frutescens* var. *acuta* and var. *japonica* plants, produce monoterpenoids (MTs) in the presence of the dominant gene G, whereas the leaves of the same plants of the gg genotype, synthesize phenylpropanoids (PPs) in place of MTs. In this work, both PPs and MTs were shown to accumulate in the calyxes of the same plants of genotype gg, whereas only PPs were detected in those of *P. frutescens* var. *citriodora* and var. *hirtella* of the gg genotype which accumulated only PPs in the leaves. These results suggested the existence of another dominant gene G' which is hypostatic to the gene G and induces the biosynthesis of MTs only in the calyx in the absence of G.

Diseases & Pests

9301-0048 Alberts, E., Francki, R.I.B. , Dietzgen, R.G.(South Australian Department of Agriculture, 25 Grenfell Street, Adelaide, SA 5000, Australia) **An epidemic of celery mosaic virus in South Australian celery.** *Australian Journal of Agricultural Research*, v. 40(5): p. 1027-1036, 1989 (27 ref, Eng).

A virus isolated from *Apium graveolens* around Adelaide was identified as celery mosaic virus (CeMV) by its host range, symptom expression, particle morphology, and cytopathic effects. The virus was shown to be serologically related to CeMV in Great Britain, New Zealand and the United States, and to a virus described as celery yellow mosaic virus in Brazil. Disease incidence was most prominent in the cultivar Tendercrisp, but the virus was also isolated from other cultivars. Incidence of the disease reached 70 percent in some crops and many of the infected plants were unfit for marketing.

9301-0049 Brown, J.K.(Department of Plant Pathology, University of Arizona, Tucson, Arizona 85721, USA) **An update on the white fly-transmitted geminiviruses in the Americas and the Caribbean Basin.** *FAO Plant Protection Bulletin*, v. 39(1): p. 5-23 , 1991 (162 ref, Eng).

The article reviews the research on white fly-transmitted (WFT) geminiviruses on plants of family Leguminosae, Malvaceae, Cucurbitaceae and Solanaceae (including medicinal plants). The need for a more thorough investigation of tropical weed species , which serve as potential sources of WFT geminiviruses has been emphasised.

9301-0050 Joshi, M.S., Raut, S.P.(Konkan krishi Vidyapeeth, Dapoli, Ratnagiri 415 712, Maharashtra, India) **Grey leaf blight disease of clove in Konkan region of**

Maharashtra. *Indian Cocoa, Arecanut and Spices Journal*, v. 15(3): p. 73-74, 1992 (4 ref, Eng).

Pestalotia versicolor was identified as the causal fungus causing severe grey leaf blight fungus diseases in *Eugenia caryophyllata*. Its pathogenicity and symptomology, host range and control measures have been discussed.

9301-0051 Kanjilal, P.B., Bhattacharyya, P.R., Baruah, P., Bordoloi, D.N. (RRL Jorhat, Assam, India) **Phytoparasitic problems of aromatic Cymbopogons in North East India.** *Journal of Biological Science Society of North East India*, v. 1: p. 52-53, 1991 (Eng).

Flowers of aromatic *Cymbopogon winterianus*, *C. flexuosus*, *C. martinii* have encountered fungal disease problems relating to *Curvularia* leaf blights, *Colletotrichum* leaf spots and *Puccinia* rusts. Results show from investigations that *Curvularia* spp attacking the *Cymbopogons* could be effectively controlled by spraying Dithane M.45 (0.25 percent) at 10-15 days intervals. Captafol (0.2 percent) was also found to be effective. NSL, New Delhi.

9301-0052 Kapur, M., Lal, B., Verma, B.R. (National Bureau of Plant Genetic Resources, New Delhi 110 012, India) **Studies on pest-risk involved in import of medicinal plants.** *Indian Journal of Plant Genetic Resources*, v. 2(1): p. 55-59, 1989 (13 ref, Eng).

An analysis was made to pinpoint the pest risk that can be present in the introduced material of *Cassia*, *Chrysanthemum*, *Digitalis*, *Dioscorea*, *Glycyrrhiza*, *Hyoscyamus*, *Mentha* etc. and in the likely event, how best to direct their presence at the time of quarantine examination, and finally how to liquidate them effectively and lower the quarantine risk so that the much needed medicinal germplasm could be made available to the users in India.

9301-0053 Lal, A., Mathur, V.K., Rajan (Nematology Unit, Plant Quarantine Division, NBPGR, New Delhi 110 012, India) **Interception of *Heterodera zeae* on vetiver plants imported from the United Republic of Tanzania and variations observed.** *FAO Plant Protection Bulletin*, v. 39(1): p. 44, 1991 (Eng).

Several cysts and second-stage juveniles were observed in *Vetiveria zizanioides* roots and accompanying soil, brought from the United Republic of Tanzania. Morphological variations between cyst nematode populations of Vetiver from India and the United Republic of Tanzania have been described.

9301-0054 Mammooty, K.P., Sasikumaran, S., Pillai, S.V. (Pepper Research Station, Panniyur, Taliparamba 670 141, Kerala, India) **Management of nursery diseases of**

black pepper. *Indian Cocoa, Arecanut and Spices Journal*, v. 15(3): p. 65-67, 1992 (4 ref, Eng).

To reduce the incidence of nursery disease of *P. nigrum*, cuttings kept at a light intensity of 11.388 K lux, spraying and drenching with Bordeaux mixture were found to be effective.

9301-0055 Murthy, J.N.A., Regupathy, A. (Centre for Plant protection Studies, T N Agricultural University, Coimbatore 641 003, TN, India) **Seasonal incidence of moringa fruit fly, *Gitona* species.** *South Indian Horticulture*, v. 40(1): p. 43-48, 1992 (5 ref, Eng).

The incidence of fruitfly, was observed on *Moringa oleifera* almost throughout the year and the peak incidence was recorded during August-September. The fruit damage ranged from 0.8 to 49.0 percent. The weather variables responsible for the fly incidence have been discussed.

9301-0056 Sreekumari, K.R., Venugopal, G., Paul, S.M., Sivadasan, C.R. (Quality Evaluation & Upgradation Laboratory, Spices Board, Cochin 682 018, Kerala, India) **Total microbial load, *Salmonella*, *Escherichia coli* moisture content in black pepper.** *Indian Spices*, v. 29(2): 8-10, 1992 (11 ref, Eng).

Black pepper (*Piper nigrum*) samples collected from growers, traders and exporters and analysed for total viable aerobic plate count, *Salmonella*, *Escherichia coli* and the percentage moisture content, were found well within the tolerance limit. The traders and exporter's samples were less contaminated than the grower's samples.

9301-0057 Velayudhan, K.C., Muralidharan, V.K., Amalraj, V.A. (NBPGR Regional Station, Vellanikkara, Trichur, Kerala, India) **Some observations on the incidence of quick wilt in germplasm collection of genus *Piper*.** *Indian Journal of Plant Genetic Resources*, v. 3(2): p. 113-115, 1990 (Eng).

Out of 400 collections of cultivated and wild *Piper* species made, 233 surviving ones belonged to *Piper nigrum* and a few to other closely related species from the forest areas in Kerala, Tamil Nadu and Karnataka. The collections were maintained in pots and plant protection measures were taken to prevent loss. Based on the observations, 9 collections were scored without any symptom of disease except mild yellowing on the leaves. Of the nine collections 6 were cultivated types *P. nigrum* of wild *P. nigrum* and 1 wild *P. trichostachyon*.

Physiology & Biochemistry

9301-0058 Balinova-Tsvetkova, A., Tsankova, P. (Institute for Roses, Aromatic and Medicinal Plants, 6100 Kazanlik,

Bulgaria) **On the extraction of *Salvia sclarea* L..** *Flavour and Fragrance Journal*, v. 7(3): p. 151-154, 1992 (17 ref, Eng).

The influence of the stage of inflorescence development, the duration and number of extractions and the temperature of the process were established for the extraction of fresh plants of clary sage (*S.sclarea*). Petroleum ether was used as a solvent. It was found out that the inflorescence development influenced the content of the extractable substances more than the quantity of the main component-sclareol-in this concrete. The basic amount of concrete was obtained during the first extraction. The clary sage had to be extracted not more than two or three times, because undesirable changes occurred in the composition thereafter- the quantity of sclareol and linalyl acetate decreased and the paraffins in the concrete increased for each further extraction. The temperature of the process and the duration of the extraction were not decisive factors for the yield of the concrete.

9301-0059 Basu, D.(Botanical Survey of India, Dehra Dun, UP, India) **Effects of growth retardant on growth, flowering and alkaloid production in *Catharanthus pusillus*.** *Indian Forester*, v. 118(9): p. 659-661, 1992 (3 ref, Eng).

Soil drench treatment with 0.1 and 1.0 mg/l CCC produced little changes in the height of plants, while 10 and 100 mg/l treatments significantly reduced the height of plants. The flowering behaviour was not influenced by any of the CCC treatments. Fresh dry weights as well as alkaloid production were significantly increased by CCC soil drench treatment.

9301-0060 Benesova, M., Bode, R.(Institute of Biochemistry and Microbiology, Faculty of Pharmacy, Komensky University, Bratislava, CSFR) **Chorismate mutase isoforms from seeds and seedlings of *Papaver somniferum*.** *Phytochemistry*, v. 31(9): p. 2983-2987, 1992 (24 ref, Eng).

Two isoforms of chorismate mutase (EC 5.4.99.5) were isolated and purified from seeds of *P.somniferum*. A 127-fold purified isoform (CM-1) was inhibited competitively by L-phenylalanine ($K_i=1.1\text{mM}$) and L-tyrosine ($K_i=0.3\text{mM}$) and activated by L-tryptophan ($K_a=2.4\text{micro M}$). CM-1 is the predominant form in poppy seeds. The ratio of CM-1: CM-2 total activity was determined to be 3:1. In seedlings, CM-2 activity is decreased in age-dependent manner. Five-day-old seedlings contained only CM-1. It was found that CM-1 is located in the chloroplasts of the seedlings.

9301-0061 Bera, B., Ganguly, S.N., Mukherjee, K.K.(Gytogenetics Laboratory, Department of Botany, Bose Institute, 93/1, Acharya Prafulla Chandra Road, Calcutta, WB, 700 009, India) **Growth retarding compounds in the seeds of diploid cytotypes of *Chenopodium album*.** *Fitoterapia*, v. 63(4): p. 364-366, 1992 (21 ref, Eng).

From the seeds of diploid cytotype of *C.album*, octadec-1-ene, octadec-1-ene-penta-triacontane, pentatriacont-1-ene and lupeol were isolated. The growth retarding activity of tetracos-1-ene, octadec-1-ene, pentatriacontane and pentatriacont-1-ene are reported.

9301-0062 Bhat, S.R., Kacker, A., Chandel, K.P.S.(N B P G R, Pusa Campus, New Delhi 110 012, India) **Plant regeneration from callus cultures of *Piper longum* L. by organogenesis.** *Plant Cell Reports*, v. 11(10): p. 525-528, 1992 (10 ref, Eng).

Competent callus was found to be initiated around the nodal ring of tissue using MS medium supplemented with 1.0mg l-1 α -NAA and 0.2 mg l-1 N6-benzyladenine. Optimum growth regulator concentrations for shoot induction and elongation have been reported. Elongated shoots were rooted on half-strength MS medium having 0.1 mg l-1 IAA. The rooted plants were successfully established in soil. IARI, New Delhi.

9301-0063 Bhati, R., Shekhawat, N.S., Arya, H.C.(Plant Biotechnology Laboratory, Department of Botany, Jodhpur University, Jodhpur, Rajasthan 342001, India) **In vitro regeneration of plantlets from root segments of *Aegle marmelos*.** *Indian Journal of Experimental Biology*, v. 30(9): p. 844-845, 1992 (5 ref, Eng).

Root segments of plantlet cloned from mature tree of *A.marmelos* were cultured on MS medium containing various combinations of auxins and cytokinins. Shoot buds differentiated from the explants after 20-25 days of culture. The number of shoots produced per explant were higher on BAP (benzylamino purine) or kinetin containing media. BAP was found to be superior to other growth regulators for shoot differentiation. About 20-25 shoot differentiated from single explant on a medium containing 0.5 mg/l each of BAP and kinetin. Incorporation of auxins in this combination stimulated the shoot number and their growth. The root-derived shoots rooted on MS (1/4 salt strength) containing NAA or IAA (0.5 mg/l). Regenerated plants were transferred to pots and then to field.

9301-0064 Bhaumik-Mandal, C., Datta, P.C.(Botanical Lab. of Pharmaco-anatomy, Calcutta University College of Science, Calcutta 700 019, WB, India) **Hormone withdrawal and xylogenesis in cultured cells of *Mentha***

arvensis. *Indian Journal of Experimental Biology*, v. 30(10): p. 874-876, 1992 (13 ref, Eng).

Individual effect of IAA and Kn on xylogenesis in *M.arvensis* was studied in relation with the pattern of thickening of tracheary elements. Withdrawal of either of the hormones quickened xylogenesis if transferred later to a medium containing both. The minimum required period of withdrawal of auxin was 3 days and that of cytokinin was 1 day.

9301-0065 Bhojwani, S.S., Arumugam, N., Arora, R., Upadhyaya, R.P. (Department of Botany, University of Delhi, Delhi, India) **In-vitro conservation of some endangered plant species of India.** *Indian Journal of Plant Genetic Resources*, v. 2(2): p. 103-113, 1989 (9 ref, Eng).

Procedures involving tissue culture, for in-vitro multiplication and short term conservation of 3 endangered medicinal plants viz., *Saussurea lappa*, *Picrorhiza kurroa* and *Podophyllum hexandrum* are reported. Attempts have also been made to preserve the cultures of these species at 5 degree C in dark for short-term.

9301-0066 Biacs, P.A., Czinkotai, B., Hoschke, A.(Central Food Research Institute, Herman Otto u 15,1022 Budapest, Hungary) **Factors affecting stability of colored substances in Paprika powders.** *Journal of Agricultural and Food Chemistry*, v. 40(3): p. 363-367, 1992 (11 ref, Eng).

A study was undertaken to investigate the change in carotenoid pigment as well as natural effective antioxidant content of paprika *Capsicum annum* during fruit ripening and storage period of the ground products. By means of modern analytical procedure, paprika fruit was found to contain alpha-tocopherol in the pericarp and gamma-tocopherol in the seeds. Ascorbic acid approached maximum level when the fruit turned red and then declined. Both antioxidants when added to the ground products have substantially reduced color impairment occurring during storage. The color degradation was estimated after 150 days of storage to be 27, percent 20 per cent and 15 percent at ambient storage conditions and 15 percent, 13 percent and 5 percent under refrigeration in untreated, gamma-tocopherol-treated, and ascorbic acid-treated powders, respectively. Among different paprika cultivars the seeds of F-03 (hot) showed the highest level of tocopherol content, and the powder of such cultivar showed thus lowest degradation of carotenoid pigments during storage.

9301-0067 Chaudhury, R., Lakhanpaul, S. , Chandel, K.P.S.(National Plant Tissue Culture Repository, NBPGR, New Delhi, India) **Cryopreservation studies on plant germplasm.** *Indian Journal of Plant Genetic Resources*, v. 2(2): p. 122-130, 1989 (36 ref, Eng).

Researches in caryopreservation indicates that seeds, meristems, shoot tips, buds and both zygotic and somatic embryos as well as embryonic axes can be preserved and trends indicate that perhaps these can be preserved for indefinite period without loss of viability or deterioration in quality and genetic integrity. Cryopreservation work undertaken by National Facility Plant. Tissue Culture Repository using seeds pollen, and in-vitro cultures has made significant progress and the information has been briefly presented.

9301-0068 Choudhary, B.K., Kar, A.(Geochemical Laboratories, Patna University, Patna, Bihar, India) **Mineral contents of Asparagus racemosus.** *Indian Drugs*, v. 29(13): p. 623, 1992 (ENG).

Mineral contents, which are biochemically important for human system were found in significant concentration in different parts.

9301-0069 Cui, Y.Y., Wang, M.Z.(Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100050, China) **Metabolic transformation of schizandrin.** *Acta Pharmaceutica Sinica*, v. 27(1): p. 57-63, 1992 (4 ref, Eng, Chi).

The metabolic transfer of schizandrin, isolated from the kernel of *Schizandra chinensis* was studied in vitro with phenobarbital induced rat liver microsomal fraction containing the NADPH generating system. Three major metabolites were isolated by preparative HPLC and identified as 7,8-dihydroxy schizandrin, 7,8-dihydroxy-2-demethyl schizandrin-and 7,8-dihydroxy-3-diemethyl-schizandrin by UV, NMR, MS spectral analysis. 7,8-dihydroxy-schizandrin was confirmed further by comparison with spectral and chromatographic behaviour of the authentic compound. The metabolic biotransformation of schizandrin was also determined.

9301-0070 Decendit, A., Liu, D., Ouelhazi, L. , Doireau, P., Merillon, J.M., Rideau, M.(Laboratoire de Biologie Cellulaire et Biochemie Vegetale, Faculte de Pharmacie, Universite de Tours, 2Bd Tonnelle, f-37042 Tours, France) **Cytokinin-enhanced accumulation of indole alkaloids in Catharanthus roseus cell cultures - The factors affecting the cytokinin response.** *Plant Cell Reports*, v. 11(8): p. 400-403, 1992 (25 ref, Eng).

Cytokinins were found to stimulate the alkaloid synthesis induced by removing auxin from the medium of a cell line of *C.roseus*. Diluting the mineral salts of the culture medium decreased the alkaloid production but increased the sensitivity of the cells. IARI, New Delhi.

9301-0071 Fernandes, P.C., Bapat, V.A., Rao, P.S. (Plant Biotechnology Section, Bhabha Atomic Research Centre, Trombay, Bombay 400085, Maharashtra, India) **In vivo germination of encapsulated somatic embryos of *Santalum album* L. (Sandalwood).** *Indian Journal of Experimental Biology*, v. 30(9): p. 839-841, 1992 (9 ref, Eng).

Regenerated and fully matured somatic embryos from embryogenic tissue of *S. album* were encapsulated in a gel matrix prepared in MS basal medium. This gel matrix was provided either with a fungicide or a food preservative. A maximum of 17 percent germination of encapsulated embryo was recorded. The ability of somatic embryos to germinate under non-sterile conditions of soil points to the possibilities of using the somatic embryos for sandalwood propagation just like seed embryo.

9301-0072 Furuya, T., Sakamoto, K., Iida, K., Asada, Y., Yoshikawa, T., Sakai, S.I., Aimi, N. (School of Pharmaceutical Sciences, Kitasato University, 5-9-1 Shirokane, Minato-ku, Tokyo 108, Japan) **Biotransformation of tabersonine in cell suspension cultures of *Cahauranthus roseus*.** *Phytochemistry*, v. 31(9): p. 3065-3068, 1992 (34 ref, Eng).

To investigate the reactions involved in the biosynthesis of vindoline from tabersonine, the bioconversion products formed when the latter compound was fed to cell suspension cultures of *C. roseus* were isolated and characterized. Two biotransformation products of tabersonine were isolated and shown to be lochnericine, which is formed by epoxidation of tabersonine at positions 14,15, and lochnerinine, the 11-methoxylation product of lochnericine. The bioconversion ratio of the main biotransformation product, lochnericine, reached a value of 80.6 percent within three days.

9301-0073 Grewal, S., Koul, A., Atal, C.K. (Regional Research Laboratory, Jammu Tawi 180001, JK, India) **Scopoletin production in long term callus, differentiated callus and axillary shoot cultures in *Physochlaina praealta* (Don) miers.** *Indian Journal of Experimental Biology*, v. 30(5): p. 801-803, 1992 (14 ref, Eng).

Three morphogenetic procedures were established in *P. praealta* from excised apical shoot apices (i) profuse callusing was induced in revised MS tobacco medium supplemented with naphthalene acetic acid (NAA; 5×10^{-6} M); (ii) shoot buds and shoots differentiated from callus when basal medium was enriched with benzyl adenine (BA; 5×10^{-6} M) and indole 3-acetic acid (IAA; 5×10^{-6} M); and (iii) axillary shoot buds differentiated in basal medium supplemented with BA (5×10^{-6} M) and NAA (5×10^{-6} M). All three cultures produced scopoletin. Accumulation of scopoletin

was significantly higher in axillary shoot cultures (2.3 mg.g⁻¹) as compared to other cultures, estimated after one experimental passage of 30 days. Axillary shoot cultures supported stable production of scopoletin during long term culturing. The present results indicate that stability in high scopoletin production depends heavily on the mode of culture proliferation.

9301-0074 Guo, M., Wang, K.Y., Xu, Gen-june (Shanghai Institute of Biochemistry, Academia Sinica, 200 031, China) **Studies on the tryptophan residues in *Pinellia ternata* lectin.** *Acta Biochimica et Biophysica Sinica*, v. 24(2): p. 146-151, 1992 (10 ref, Chi, Eng).

Tryptophan (Trp) residues in *P. ternata* lectin (PTL) were modified with N-bromosucinimide (NBS). The data showed that there were four trp residues in PTL, one trp per subunit. The ultra violet spectrum and the fluorescence emission spectrum of PTL were both changed after treatment with NBS. The peak of fluorescence emission at 352 nm blue shifted to 308 nm during modification of PTL. The results implied that mannan binding activity and antigenicity of PTL were related to the amount of modified Trp.

9301-0075 Gurdeep Kaur, Singh, R.P., Rathore, T.S., Shekhawat, N.S. (Plant Biotechnology Laboratory, Department of Botany, University of Jodhpur, Jodhpur 342001, Rajasthan, India) **In vitro propagation of *Anogeissus sericea*.** *Indian Journal of Experimental Biology*, v. 30(5): p. 788-791, 1992 (20 ref, Eng).

Multiple shoots were induced from cotyledonary node segments of *A. sericea* var. *sericea* and *A. sericea* var. *nummularia*. Eight to ten shoots were induced from nodal region on MS medium containing 0.1 mg l⁻¹ indole-3-acetic acid (IAA) + 4.0 mg l⁻¹ benzylaminopurine (BAP), ascorbic acid (50.0 mg l⁻¹), citric acid (25.0 mg l⁻¹) and adenine sulphate (25.0 mg l⁻¹). In *A. sericea* var. *nummularia*, 10-15 shoots differentiated from a single node on MS medium supplemented with 0.1 mg l⁻¹ IAA and 2.0 mg l⁻¹ BAP. In vitro raised shoots were cut into segments (each with one node), and cultured on fresh medium for further multiplication. Shoot multiplication rate was maintained in *A. sericea* var. *sericea* upto 16 successive passages. The original cotyledonary explants were repeatedly subcultured on the fresh medium and each time crop of fresh shoots could be harvested. The differentiated shoots were rooted on half strength MS + indole butyric acid (IBA). Thus in vitro raised plants were transferred to pots. Cotyledons, hypocotyl, leaf and root segment-derived calli differentiated into embryo like structures in *A. sericea* var. *sericea* on MS medium containing growth regulators.

9301-0076 Hiraoka, H. (Niigata College of Pharmacy, 5-13-2 Kamishivei-cho, Niigata 950-21, Japan) **Cold storage of *Atractylodes lancea* shoot cultures.** *Shoyakugaku Zasshi*, v. 46(3): p. 206-209, 1992 (5 ref, Eng, Jap).

All the shoots of *A. lancea*, cultured on the shooting proliferation medium survived cold storage at 0-5 degree C for 24 months. However, practical period of cold storage should be about 12 months, since the survival rate of plantlets on potting decreased if the cold-storage period exceeded 12 months. Rooted shoots cultured on the rooting medium hardly survived six month cold storage, showing that the present storage method is not applicable to plantlets of *A. lancea*.

9301-0077 Ishimaru, K., Ikeda, Y., Kuranari, Y., Shimomura, K.* (Tsukuba Medicinal Plant Research Station, National Institute of Hygienic Sciences, 1 Hachimandai, Tsukuba, Ibaraki 305, Japan) **Growth and lobeline production of *Lobelia inflata* hairy roots.** *Shoyakugaku Zasshi*, v. 46(3): p. 265-267, 1992 (6 ref, Eng).

Lobeline (1) production in two clones of *L. inflata* hairy roots cultured in hormone-free Murashige-Skoog liquid medium was determined. One clone (Li-A) produced a large amount of 1 (52.1 microg/flask) in the dark condition, whose level was more than 3 times larger than that (15.1 microg/flask) in the light. In contrast, the other clone (Li-B) gave a higher production of 1 in the light (79.9 microg/flask) than in the dark (42.1 microg/flask).

9301-0078 Jung, K.H., Kwak, S.S., Kim, S.W., Lee, H., Choi, C.Y., Liu, J.R. (Plant Cell Biology Laboratory, Genetic Engineering Research Institute, Korea Institute of Science and Technology, P O Box 17, Taedok Science Town, Taejon, 305-606, Korea) **Improvement of the catharanthine productivity in hairy root cultures of *Catharanthus roseus* by using monosaccharides as a carbon source.** *Biotechnology Letters*, v. 14(8): p. 695-700, 1992 (11 ref, Eng).

Hairy root culture of *C. roseus* preferentially consumed sucrose, resulting in about 40 percent higher growth rate. Fructose enhanced the catharanthine yield about two-fold. The elevated yield was not seemingly ascribed to the higher osmolarity per unit weight of fructose than sucrose. A two stage culture using sucrose and fructose improved volumetric yields of catharanthine about two-fold, i.e. 41 mg/l. IARI, New Delhi.

9301-0079 Lecky, R., Hook, I., Sheridan, H. (Department of Pharmacognosy, School of Pharmacy, 18, Sbrewsbury Road, Dublin 4, Ireland) **Enhancement of dihydrosanguinarine production in suspension cultures of *Papaver bracteatum*, 1. Medium modifications.** *Journal of*

Natural Products, v. 55(10): p. 1513-1517, 1992 (21 ref, Eng).

A suspension culture of *P. bracteatum* initially yielded high levels of the benzophenanthridine alkaloid dihydrosanguinarine. This productivity was lost on repeated subculture. In an attempt to improve alkaloid yields modifications in the concentrations of various minor constituents present in the culture medium were evaluated. The vitamins thiamine and pyridoxine and the microinorganic constituents cobalt, manganese, zinc, and copper were examined at 0.5, 2.0 and 4.0 times their concentration normally present in the modified Murashige and Skoog medium. Only copper when added at 2.0 and 4.0 times the control concentration significantly enhanced alkaloid yields. A fourfold increase was noted when twice the copper concentration was included in the medium at subculture, while a doubling of yields resulted from a fourfold copper concentration added during active cell growth, on day 14 of the growth cycle.

9301-0080 Luis, J.G., Gonzalez, A.G., Andres, L.S., Mederos, S. (C P N O Antonio Gonzalez, Instituto Universitario de Bio-Organica Universidad de La Laguna, Carretera La Esperanza 2, La laguna, 38206 Tenerife, Canary Islands, Spain) **Diterpenes from in vitro-grown *Salvia canariensis*.** *Phytochemistry*, v. 31(9): p. 3272-3273, 1992 (5 ref, Eng).

The new diterpene, 16-acetoxycarnosol together with the known compounds, carnosic acid, 11-acetoxycarnosic acid and carnosol were isolated from seven-day-old in vitro grown plantlets of *S. canariensis*. Neither the new compound nor carnosic acid could be obtained from 25-day-old plantlets which, however, contained 7-methoxyrosmanol.

9301-0081 Lutterbach, R., Stockigt, J. (Lehrstuhl für Pharmazeutische Biologie der Johannes Gutenberg-Universität Mainz, Institut für Pharmazie, Staudinger Weg 5, D-6500 Mainz, Germany) **High-yield formation of arbutin from hydroquinone by cell suspension cultures of *Rauwolfia serpentina*.** *Helvetica Chimica Acta*, v. 75(6): p. 2009-2011, 1992 (12 ref, Eng).

High-density cell-suspension cultures of *R. serpentina* cultivated in a nutrition medium optimized for the production of the glucoalkaloid raucaffricine synthesize hydroquinone glycosides from continuously added hydroquinone with a total yield of 23.87 g/l (18 g/l of arbutin and 5.87 g/l of a hydroquinone diglycoside) in 7 days. This arbutin production is by far the highest formation of a natural product by plant-cell-culture systems reported to date.

9301-0082 Majak, W., McDiarmid, R.E., Cristofoli, W., Fang Sun, Benn, M. (Research Station, Agriculture Canada, 3015 Ord Road, Kamloops, Canada V2B 8A9, Canada) **Content of zygacine in *Zygadenus venenosus* at different stages of growth.** *Phytochemistry*, v. 31(10): p. 3417-3418, 1992 (11 ref, Eng).

A TLC-scanning procedure was developed for the quantitative determination of zygacine in death camas (*Z. venenosus*). The alkaloid levels increased during the pod stage of development when the veratryl and angelyl esters of zygadenine were also detected at high concentrations.

9301-0083 Manunta, A., Tirillino, B., Fraternale, D. (Institute of Botany and Botanical Garden, Via Bramante 28, 61029 Urbino, Italy) **Secretory tissues and essential oil composition of *Bupleurum fruticosum* L..** *Journal of Essential Oil Research*, v. 4(5): p. 461-466, 1992 (9 ref, Eng).

The composition of the essential oil of stem and leaves of *B. fruticosum* was investigated by capillary GC and GC/MS. It was determined that the composition of these two oils was quite different, although the secretory system forms a coherent network between the stem and the leaves. The stem essential oil was found to contain 22 compounds (one of them was not identified) while only 14 compounds were identified in the leaf oil.

9301-0084 Menghini, A., Capuccella, M., Pagiotti, R., Pocceschi, N., Spigarelli, M. (Department of Plant Biology, Borgo XX Giugno 74, I-06121 Perugia, Italy) **Pigment content and methyl chavicol production in *Agastache foeniculum* Kuntze cultured in vitro.** *Journal of Essential Oil Research*, v. 4(5): p. 483-486, 1992 (4 ref, Eng).

A. foeniculum was cultivated in vitro in order to initiate a clone selection of ecotypes and chemotypes. The shoots showed well-formed secretory structures on the leaf lamina. The production of methyl chavicol (estragole) and trans-anethole was examined on the shoots cultured in vitro and compared to other plantlets of the same clonal population which were grown in the greenhouse. Under all the experimental conditions examined, *A. foeniculum* produced high percentages of methyl chavicol and trace amounts of trans-anethole. Addition of shikimic acid to the culture media, increased the concentration of chlorophyll (a and b), some carotenoids and methyl chavicol with respect to untreated media. A direct correlation between methyl chavicol production and pigment concentration was not observed.

9301-0085 Mutsch-Eckner, M., Meier, B., Wright, A.D., Sticher, O. (Departement Pharmazie, Eidgenossische Technische Hochschule (ETH) Zurich, CH-8092 Zurich,

Switzerland) **Gamma -glutamyl peptides from *Allium sativum* bulbs.** *Phytochemistry*, v. 31(7): p. 2389-2391, 1992 (13 ref, Eng).

Four gamma-glutamyl peptides were isolated from a hydrophilic extract of garlic bulbs. gamma-L-Glutamyl-S-(trans-1-propenyl)-L-cysteine has been isolated as a new genuine constituent of *A. sativum*. For the first time detailed NMR data for gamma-L-glutamyl-S-allyl-L-cysteine, gamma-L-glutamyl-S-(trans-1-propenyl)-L-cysteine and gamma-L-glutamyl-S-allylthio-L-cysteine are reported. The structures of the four compounds were established on the basis of their spectral data (IR, FABMS, ¹H and ¹³C NMR). Extensive 2D heteronuclear correlated NMR experiments allowed the assignment of all proton and carbon resonances for all reported compounds.

9301-0086 Nandi, R.P. (Research Laboratory, Mungpoo, Darjeeling 734313, WB, India) **Increase in productivity regime of some well known medicinal and aromatic plants used in Ayurvedic system of medicines.** *Advances in Plant Sciences*, v. 5(special issue): p. 274-282, 1992 (17 ref, Eng).

Different experimental factors designed to augment active principles of different medicinal and aromatic plants are presented. Light plays a positive role in synthesis of secondary metabolites. NPK, Mg and Mn augmented the content of active principles. The contents of active principles are also enhanced appreciably by removal of flowers from the plants.

9301-0087 Nguyen, C., Bourgaud, F., Forlot, P., Guckert, A. (Laboratoire Agronomie et Environnement, ENSAIA-INRA, 2 Avenue de la Forêt de Haye, 54500 Vandœuvre-lès-Nancy, France) **Establishment of hairy root cultures of *Psoralea* species.** *Plant Cell Reports*, v. 11(8): p. 424-427, 1992 (29 ref, Eng).

Of eight *Psoralea* species inoculated with *Agrobacterium rhizogenes* strains 8196 and 9402, hairy roots were induced only by strain 9402. Two furanocoumarins usually found in the roots of *Psoralea* species, psoralen and angelicin, were not detected in cultured transformed and non transformed roots even when some chitosan was added to the medium. A possible translocation of these compounds from the aerial parts to the roots has been suggested. IARI, New Delhi.

9301-0088 Oi, Y., Kawada, T., Watanabe, T., Iwai, K. (Faculty of Home Economics, Kobe Women's University, Suma-ku, Kobe 654, Japan) **Induction of capsaicin-hydrolyzing enzyme activity in rat liver by continuous oral administration of capsaicin.** *Journal of*

Agricultural and Food Chemistry, v. 40(3): p. 467-470, 1992 (13 ref, Eng).

Effects of continuous oral administration of capsaicin (a pungent principal of hot red pepper) (CAP) on the CAP-hydrolyzing enzyme activity in liver were investigated in rats. Rats were given a standard laboratory diet supplemented with 14 mg of CAP/100g of diet, ad libitum, for 3 days and 1 and 3 weeks. It was found the CAP administration for 1 and 3 weeks significantly increased the CAP-hydrolyzing enzyme activity compared with that of each control group. Reaction products were chromatographically identified as vanillyl alcohol, vanillin, and vanillic acid. The CAP-hydrolyzing enzyme activity found in rat liver was also detected in chicken, hog, and bovine livers. These results suggest that the CAP-hydrolyzing enzyme activity reached maximum induction by continuous oral administration of CAP for 1 week.

9301-0089 Osawa, T., Katsuzaki, H., Hagiwara, Y., Hagiwara, H., Shibamoto, T. (Department of Food Science and Technology, Faculty of Agriculture, Nagoya University, Chikusa-ku, Nagoya 464, Japan) **A novel antioxidant isolated from young green barley leaves.** *Journal of Agricultural and Food Chemistry*, v. 40(7): p. 1135-1138, 1992 (25 ref, Eng).

An ethanol extract obtained from freeze-dried young green barley leaves *Hordeum vulgare* was fractionated with column chromatography. The fraction exhibiting strongest antioxidative activity was further purified by HPLC. The active component was identified as 2''(3'')-O-glycosylisovitexin by gas chromatography, UV, FAB-MS, ¹H NMR and ¹³C NMR. Its antioxidative activity was almost equivalent to that of alpha-tocopherol in a lipid peroxidation system at the level of 100 microg/1.5 mg of ethyl linoleate.

9301-0090 Phillip, V.J. (Department of Botany, Calicut University, Calicut, Kerala, India) **Use of tissue culture technology in Vanilla and possibilities of germplasm conservation.** *Indian Journal of Plant Genetic Resources*, v. 2(2): p. 114-121, 1989 (13 ref, Eng).

Plantlets were produced from tip cultures of young aerial roots of *V. planifolia*. With the breakthrough of the root cap, the cells of the quiescent centre divided forming a hemispherical mass of cells which developed either into a single shoot meristem or organised themselves into several meristems bearing leaf primordia. After a few leaves have been formed a root meristem differentiated establishing a well formed plantlet. The root apical meristem conservation because they are genetically stable, less differentiated and permit plant regeneration in high frequency.

9301-0091 Purohit, S.D., Tak, K. (Plant Biotechnology Laboratory, Department of Botany, College of Science, M.L.Sukhadia University, Udaipur 313001, Rajasthan, India) **In vitro propagation of an adult tree *Feronia limonia* L. through axillary buranching.** *Indian Journal of Experimental Biology*, v. 30(5): p. 377-379, 1992 (11 ref, Eng).

Nodal explants, bearing an axillary bud obtained from mature elite tree of *F. limonia* were used to initiate shoot cultures. Murashige and Skoog's medium having 3/4-salts supplemented with 3 percent sucrose, 2 mg/l-1 kinetin, 0.5 mg/l-1 BAP and 0.01 mg/l-1 NAA and antioxidants resulted in production of 15 shoots after 8 weeks. The basal mature nodal stem of explants showed less callusing as compared to young explants, thus promoting the rate of multiplication. The in vitro multiplied shoots could be rooted on 1/4 strength MS salts, 0.6 percent agar, 1 percent sucrose and 1.5 mg/l-1 IBA with 70 percent frequency. Rooted shoots could be transplanted to vermiculite-soil (3:1) mixture in the greenhouse with 70 percent transplantation success.

9301-0092 Radhamani, J., Chaudhury, R., Chandel, K.P.S. (National Facility for Plant Tissue Culture Repository, NBPGP, New Delhi 110012, India) **Inhibition of seed germination by the endocarp in neem (*Azadirachta indica* A.Juss.).** *Indian Journal of Plant Genetic Resources*, v. 3(1): p. 35-40, 1990 (9 ref, Eng).

The endocarp inhibited the seed germination in neem (*A. indica*) by delaying the initiation of germination and lowering the germination percentage to about three to four times. The endocarp not only acted as a physical barrier but also seemed to contain some inhibitory substances(s) which possibly acted as a metabolic barrier during seed germination.

9301-0093 Rajaram, M., Janardhanan, K. (Seed Physiology Laboratory, Department of Botany, Bharathiar University, Coimbatore 641046, TN, India) **Certain aspects of chemical analyses of the seeds of wild relatives of *Mucuna* beans, *Mucuna hirsuta* W & A and *M. atropurpurea* DC.** *Advances in Plant Sciences*, v. 5(special issue): p. 237-245, 1992 (37 ref, Eng).

The yield based agrobotanical characters and certain aspects of biochemical analyses were carried out for the two wild relatives of *Mucuna* beans viz., *M. hirsuta* and *M. atropurpurea*. In most of the pod characters *M. hirsuta* shows striking similarities to the tribal pulse, *M. pruriens*. Relatively high levels of crude protein and crude lipid were present in *M. hirsuta*. The contents of crude protein and crude lipid of *M. atropurpurea* were found to be closer to those of most of the commonly consumed pulses. The food energy value of *M. hirsuta* exceeds that of most of the

Mucusna spp. The protein fractionation, mineral analysis, analysis of certain antinutritional factors like total free phenols, tannins, L-DOPA and phytohaemagglutinins were also carried out.

9301-0094 Ramawat, K.G., Bhardwaj, L., Tewari, M.N. (Department of Botany, University of Jodhpur, Jodhpur 342 001, Rajasthan, India) **Anti-tumour drugs produced by tissue culture: A short review.** *Bionature*, v. 12(1&2): p. 33-41, 1992 (34 ref, Eng).

The antitumour metabolites production in *Catharanthus roseus*, *Cocculus pendulus*, *C. hirsutus* and *Ochrosia elliptica* has been investigated in cultures and high alkaloid producing cell lines have been established. The pertinent information on production of antineoplastic agents through tissue culture are discussed. NSL, New Delhi.

9301-0095 Roewer, I.A., Cloutier, N., Nessler, C.L., De Luca, V. (IRBV, Department of Biological Sciences, University of Montreal, 4101 Sherbrooke Street E, Montreal, Quebec, Canada, HIX 2B2) **Transient induction of tryptophan decarboxylase (TDC) and strictosidine synthase (SS) genes in cell suspension cultures of *Catharanthus roseus*.** *Plant Cell Reports*, v. 11(2): p. 86-87, 1992 (18 ref, Eng).

The expression of TDC and SS enzyme activities preceded by the transient appearance of mRNAs for both enzymes, suggesting transcriptional control of these events has been demonstrated. IARI, New Delhi.

9301-0096 Roy, M., Basu, P.S. (Department of Botany, University of Burdwan, Golapbag, Burdwan 713 104, WB, India) **Contents of hormones and indole acetic acid metabolism in root nodules of *Clitoria ternatea* L.** *Indian Journal of Experimental Biology*, v. 30(9): p. 835-838, 1992 (31 ref, Eng).

Higher amounts of plant growth substances such as, indole acetic acid (IAA), cytokinin-like substances (CK), gibberellic acid-like substances (GA) and abscisic acid-like substances (ABA) were obtained from mature root nodules of the leguminous twiner *C. ternatea* than the roots. The level of tryptophan, precursor of IAA, was also higher in the nodules. The intra-nodular metabolism of IAA was evidenced by the presence of IAA oxidising enzymes in the nodules. The levels of these enzymes were higher in the roots than the nodules, which might be the cause of lower level of IAA in the roots. The *Rhizobium* spp isolated from the root nodules produced high amount of IAA in culture when supplemented with tryptophan. The bacteria preferred L-isomer over DL-isomer of tryptophan for the IAA production. The possible relation of this IAA production with the *Rhizobium* - legume symbiosis is discussed.

9301-0097 Saito, K., Yamazaki, M., Anzai, H., Yoneyama, K., Murakoshi, I. (Faculty of Pharmaceutical Sciences, Chiba University, YaYoi-cho 1-33, Chiba 260, Japan) **Transgenic herbicide-resistant *Atropa belladonna* using an Ribinary vector and inheritance of the transgenic trait.** *Plant Cell Reports*, v. 11(5/6): p. 219-224, 1992 (36 ref, Eng).

The transgenic plants showed resistance towards bialaphos and phosphinothricin. Tropane alkaloids of normal amounts were produced in the transformed regenerants. Successful application of transformation with an Ri plasmid binary vector for conferring an agronomically useful trait to medicinal plant has been reported. IARI, New Delhi.

9301-0098 Salgare, S.A., Palathingal, T. (Department of Botany, Institute of Science, Bombay 400032, Maharashtra, India) **Effect of industrial pollution at Sewri on pollen physiology of successive flowers of *Moringa pterygosperma*.** *Bioved*, v. 2(2): p. 131-134, 1991 (3 ref, Eng).

Institute of Science was taken as the unpolluted area and the experiments were set at the Institute with pollen of successive flowers of *M. pterygosperma* collected from Sewri and Institute. Inhibition was noticed in the rate of pollen germination and tube growth, and on the rate of decrease in pollen germination and tube growth in pollen of flowers collected from Sewri. A maximum inhibition of 86.13 percent and 50.85 percent was observed in the rate of pollen germination tube growth, respectively, while 98.94 percent and 70.58 percent was the maximum inhibition noted in the rate of decrease in pollen germination and tube growth respectively. NSL, New Delhi.

9301-0099 Salgare, S.A., Palathingal, T. (Department of Botany, Institute of Science, Bombay 400032, Maharashtra, India) **Evaluation of industrial pollution of Bombay by pollen of *Catharanthus roseus* (red-flowered).** *Bioved*, v. 2(2): p. 195-198, 1991 (9 ref, Eng).

Potentiality of pollen germinability was noticed in F and F-24 series. Higher percentage of pollen germination as well as tube length was noted in F series. Industrial pollution of Sewri inhibited the rate of pollen germination and tube growth, and the rate of decrease in pollen germinability and tube growth of *C. roseus*. 17.74 and 45.45 was the maximum inhibition caused by the pollution in the rate of pollen germination and tube growth respectively. As high as 9.63 percent and 39.25 percent inhibition was noted in the rate of decrease of pollen germination and tube growth respectively. NSL, New Delhi.

9301-0100 Sato, H., Taguchi, G., Fukui, H., Tabata, M. (Faculty of Pharmaceutical Sciences, Kyoto University,

Yoshida, Kyoto 606, Japan) **Role of malic acid in solubilizing excess berberine accumulating in vacuoles of *Coptis japonica*.** *Phytochemistry*, v. 31(10): p. 3451-3454, 1992 (23 ref, Eng).

The capability of cultured cells of *C.japonica* for accumulating a supersaturated solution of berberine (more than 70 mM) in vacuoles was investigated in relation to the solubility of various berberine salts. The results of experiments showed that the solubility of berberine is dependent on its paired anion, varying from 3 mM for nitrate to 640 mM for malate, suggesting that a high concentration of malic acid (168mM) found in the vacuole greatly contributes to the formation of a highly water-soluble salt of berberine. The production of berberine in cultured cells was accompanied by a steady increase of malic acid during the entire culture period. The present study has demonstrated an important role of a specific organic acid in solubilizing an excess of quarternary alkaloid in the vacuole.

9301-0101 Sharma, N., Chandel, K.P.S.(NBPGR, Pusa Campus, New Delhi 110 012, India) **Low-temperature storage of *Rauvolfia serpentina* Benth. ex Kurz.: An endangered, endemic medicinal plant.** *Plant Cell Reports*, v. 11(4): p. 200-203, 1992 (14 ref, Eng).

On a standart shoot culture medium, nodal cultures could be maintained for nine months at 25 degree C. Low temperature incubation of in vitro cultures appeared highly promising as cultures exhibited normal health even after 15 months of storage at 15 degree C; while 10 degree C and 5 degree C were found deleterious to growth of the *R.serpentina* cultures. IARI, New Delhi.

9301-0102 Shi, L., Gorou, Y., Shindo, K., Ogawa, K., Shida, Y., Sashida, Y., Shimomura, H., Araki, C., Yoshida, T.(Tokyo College of Pharmacy, 1432-1 Horinouchi, Hachioji, Tokyo 192-03, Japan) **Synephrine contents and their seasonal variation in peels of Citrus plants.** *Shoyakugaku Zasshi*, v. 46(2): p. 150-155, 1992 (10 ref, Eng).

The synephrine contents in the peels from 42 species and cultivars of the genus *Citrus* and in those from two *Fortunella* and one *Poncirus* species which were closely related to the genus *Citrus*, were compared using GC. Derivatives of synephrine to trimethylsilyl ether and extraction of volatile derivatives were carried out. Specimens were collected at various seasons and the seasonal changes in the synephrine contents of these peels were analysed.

9301-0103 Southwell, I.A., Brophy, J.J.(Agricultural Institute, Wollongbar, NSW, 2477, Australia) **Differentiation within the Australian *Tasmannia* by es-**

sential oil comparison. *Phytochemistry*, v. 31(9): p. 3073-3081, 1992 (20 ref, Eng).

The seven Australian species of the genus *Tasmannia* (pepper bushes) were examined for essential oil content by steam distillation and solvent extraction. Each species was distinguished on essential oil grounds with intraspecific variation most obvious with *T.membranea* and *T.insipida*. *Tasmannia* oils were characterized by monoterpenoids alpha-and beta-pinene, limonene, sabinene, alpha-phellandrene, 1,8-cineole and linalol; sesquiterpenoids caryophyllene, bicyclogermacrene, germacrene D, cadinal-1,4-diene, calamenene, alpha-copaene, alpha-cubebene, elemol, alpha-, beta-and gamma-eudesmol and viridiflorol and phenylpropanoids eugenol, safrole and myristicin.

9301-0104 Srivastava, V.K., Singh, B.M., Gupta, R.(NBPGR, Pusa Campus, New Delhi 110012, India) **The composition and characteristics of seed oil of *Celastrus paniculatus*.** *Indian Journal of Plant Genetic Resources*, v. 3(1): p. 111-113, 1990 (5 ref, Eng).

An analysis of five accessions of *C.paniculatus* collected from different altitudes in UP hills and three samples procured from markets in Delhi, Vindhyan range (Indore) showed that seed contained approximately 50 percent highly coloured fairly aromatic oil. Delhi market samples gave 0.1815 percent total alkaloids in seeds. Of this 0.1634 percent was in the oil and 0.0098 percent was found in the defatted seeds. The samples from Indore showed higher total alkaloid content ranging from 0.1008 to 0.2709 percent. Acid value of oil in the accessions from UP was lower than those of market samples. It is suggested that Vindhyan ranges should be surveyed extensively to collect promising materials rich in physiologically active alkaloids.

9301-0105 Toivonen, L., Laakso, S., Rosenqvist, H.(Helsinki University of Technology, Department of Chemical Engineering, Laboratory of Biochemistry and Microbiology, Kemistintie 1, SF-02150 Espoo, Finland) **The effect of temperature on growth, indole alkaloid accumulation and lipid composition of *Catharanthus roseus* cell suspension cultures.** *Plant Cell Reports*, v. 11(8): p. 390-394, 1992 (35 ref, Eng).

Lowering the cultivation temperature increased the total fatty acid content per cell dry weight relative to that at higher temperatures, mainly because of increased accumulation of unsaturated C18 acids. An increase in the relative proportion of phosphatidylcholine and phosphatidylethanolamine was observed. In spite of membrane modifications, the indole alkaloid content of the cells or the medium was not affected by temperature change. IARI, New Delhi.

9301-0106 Toivonen, L., Laakso, S., Rosenqvist, H. (Helsinki University of Technology, Department of Chemical Engineering, Laboratory of Biochemistry and Microbiology, Kemistinte 1, SF-02150, Espo, Finland) **The effect of temperature on hairy cultures of *Catharanthus roseus*: Growth, indole alkaloid accumulation and membrane lipid composition.** *Plant Cell Reports*, v. 11(8): 395-399, 1992 (22 ref, Eng).

Cultivation of *C.roseus* hairy root cultures at different temperatures was found to have an effect on growth rate and indole alkaloid content as well as lipid composition. Despite the changes in membrane lipids, no effect on the distribution of indole alkaloids between the roots and the medium could be detected. Instead, the level of alkaloid accumulation showed a clear increase with lowering temperature. IARI, New Delhi.

9301-0107 Tumova, L., Dusek, J. (Katedra farmakognozie farmaceuticke Fakulty University Karlovy, Heyrovského 1203, 501 65 Hradec Kralove) **Effect of amino acids on the growth of a tissue culture of *Ononis arvensis* L. and on the production of flavonoids.** *Ceskoslovenska Farmacie*, v. 41(3): p. 99-101, 1992 (12 ref, Cze, Eng).

The content of flavonoids was in most cases positively influenced by the addition arginine, glutamic acid, proline, glycine, leucine, methionine, serine, threonine and valine into the culture medium. Some of the acids increased the growth of culture in a statistically significant manner.

9301-0108 Umetsu, K., Kasahara, M., Hiraoka, N., Tomita, Y. (Niigata College of Pharmacy, 5-13-2 Kamishinei-cho, Niigata 950-21, Japan) **Furanocoumarin composition in the fruit of *Glehnia littoralis* of different geographical origin.** *Shoyakugaku Zasshi*, v. 46(2): p. 179-183, 1992 (12 ref, Eng).

The furanocoumarin compositions of fruits differed considerably from those of roots and rhizomes in fruit imperatorin and phellopterin were major coumarins, xanthotoxin, bergapten, isoimperatorin and 8-geranyloxypsoralen were minor ones, and psoralen and bergamottin were undetectable in any sample analysed. The total coumarin content (0.8-1.7 percent) of the fruit was higher than that (0.01-0.15 percent) of the underground parts. About 60 percent of the coumarins in the fruit were in seed. There was a significant difference in the mericarp size among the plants collected in different places but, in contrast to the case of the underground organs little geographical variability was observed in the furanocoumarin composition and content of the fruit.

9301-0109 Veeresham, V., Kokate, C.K., Ramesh, B., Venkateshwarlu, V. (University college of Pharmaceutical

Sciences, Kakatiya University, Warangal 506009, AP, India) **Influence of precursor supplementation on bioproduction of capsaicin in static culture of *Capsicum annum*.** *Indian Journal of Pharmaceutical Sciences*, v. 54(5): p. 178-182, 1992 (8 ref, Eng).

Effect of exogenous supply of cholesterol, pregnenolone, L-ascorbic acid, shikimic acid, D-limonene, and squalene (50mg/l) on production of capsaicin in static cultures of *C.annuum* has been investigated. There were appreciable changes in capsaicin content due to treatment of 50mg/l of D-limonene (0.136 percent mg of capsaicin) and 100mg/l of L-ascorbic acid (0.169 percent mg of capsaicin). Capsaicin was detected only in the medium indicating its extracellular in vitro accumulation. Other precursors investigated did not alter significantly the bioproduction pattern of capsaicin.

9301-0110 Wang, H., Huang, F., Li, a., Shao, Q., Niu, D. (Institute of Genetics, Chinese Academy of Sciences, Beijing, China) **Regeneration of transgenic *Lycium barbarum* L.** *Chinese Journal of Biotechnology*, v. 7(3): p. 185-189, 1991 (6 ref, Eng).

A simple and effective system for the transformation and regeneration of chinese medicinal plant *L.barbarum* has been described. Calli originating from young stem segments on selective induction medium could differentiate into buds on selective differentiation medium rapidly and finally developed into whole plants. IARI, New Delhi.

9301-0111 Yaron, A., Coben, E., Arad, S. (Institutes for Applied Research, Ben-Gurion University of the Negev, P O Box 1025, 84100 Beer-Sheva, Israel) **Stabilization of *Aloe vera* gel by interaction with sulfated polysaccharides from red microalgae and with Xanthan gum.** *Journal of Agricultural and Food Chemistry*, v. 40(8): p. 1316-1320, 1992 (20 ref, Eng).

A.vera gel, the fibre free mucous exudate of the succulent leaves of *Aloe barbadensis*, was mixed with sulfated polysaccharides isolated from red microalgae, anionic polysaccharide from Xanthan gum or with non-ionic guar gum to determine possible stabilizing effects. Results showed that the interaction between gel and xanthan gum polysaccharides as shown by increased viscosities, apparent yield points and hysteresis. The same properties were not observed in the xanthan gum.

9301-0112 Yoshimatsu, K., Shimomura, K. (Tsukuba Medicinal Plant Research Station, National Institute of Hygienic Sciences, 1, Hachimandai, Tsukuba, Ibaraki, 305, Japan) **Transformation of opium poppy (*Papaver somniferum* L.) with *Agrobacterium rhizogenes* MAFF**

03-01724. *Plant Cell Reports*, v. 11(3): p. 132-136, 1992 (19 ref, Eng).

Non-transformed shoots were found to contain much more codeine (1310 microg/g dry wt.) than morphine (50 microg/g dry wt.), while the transformed shoot cultures did not contain morphine, although the level of morphinan alkaloids in the transformed shoots (213 microg/g morphine equivalents/g fr.wt.) was comparable to that in non transformed shoots (182 microg morphine equivalents/g fr.wt.) by ELISA. IARI, New Delhi.

9301-0113 Zhou, L., Zheng, G. (Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, Yunnan, China) A study on the technology of mass cell culture of American ginseng (*Panax quinquefolium* L.). *Chinese Journal of Biotechnology*, v. 7(3): p. 191-196, 1991 (13 ref, Eng).

Designing of an appropriate fermentor to culture American ginseng cells on a large scale has been discussed. Stirred fermentor was used for large scale cell culture and production of saponin for industrial purposes. With the increase in osmotic pressure stress by the addition of mannitol to the nutrient medium in fermentation culture, the content of saponin of the cell cultures was increased greatly but the cell growth was inhibited. IARI, New Delhi.

Pharmacognosy

9301-0114 Ahmad, J., Siddiqui, Z.S., Zaman, A. (Department of Research in Unani Medicine, Aligarh Muslim University, Aligarh 202 002, UP, India) Physico-chemical standardization of Habb-e-Mumsik. *Journal of Research and Education in Indian Medicine*, v. 11(3): p. 37-38, 1992 (4 ref, Eng).

Habb-e-Mumsik is an important Unani compound preparation used for the treatment of excessive nocturnal emission. The standardization was carried out according to the parameters laid down by CCRUM and also includes organoleptic properties. The ash values, total fat, saponification and iodine values were performed. Successive extraction in petrol, chloroform and alcohol were carried out. Qualitative estimation of different secondary metabolites and parameters like resin, tannin, alkaloid, crude fiber and values of thin layer chromatography of different extractives are reported.

9301-0115 Bagchi, G.D., Srivastava, G.N., Srivastava, A.K. (Botany and Pharmacognosy Division, CIMAP, Post Bag No.1, R S M Nagar, Lucknow 226 016, UP, India) A study on the calcium oxalate crystals of some medicinal barks. *Indian Drugs*, v. 29(12): 561-567, 1992 (6 ref, Eng).

Type, shape, size and localisation of calcium oxalate crystals in various tissue region of barks of forty five medicinal plants have been summarized. Fluorescence character of bark powders exposed to UV light (366 nm) has also been reported. Solitary calcium oxalate crystals were found to be more common among the barks studied. Crystals were found to occur throughout the bark but were commonly distributed in cortical and secondary phloem regions.

9301-0116 Carnat, A., Lamaison, J.L., Petitjean-Freytet, C. (Laboratoire de Pharmacognosie et Phytotherapie, Faculte de Pharmacie, Universite d'Auvergne, 28, Place Henri Dunant, F 63000 Clermont-Ferrand, France) The Agrimonia: Comparative study of Agrimonia. *Plantes Medicinales et Phytotherapie*, v. 25(4): p. 202-211, 1991 (35 ref, Eng, Fre).

Dried flowering tops of *A.eupatoria* and *A.procera* were distinguished by their botanical characters and by their chemical composition. The levels of principal constituents average respectively: tannins 7.4 and 9.5 percent, total flavonoids 0.90 and 0.72 percent, rutin 0.17 and 0.16 percent, hyperoside 0.37 and 0.18 percent, isoquercitrin 0.21 and 0.13 percent, quercitrin 0.05 and 0 percent, ashes 7.3 and 6.5 percent. The substitution of *A.eupatoria* flowering top by that of *A.procera* is discussed. 11 batches of commercial origin were also examined for a comparative study. Pharmacopoeial specifications are proposed for a monograph Agrimoniae Herba.

9301-0117 Dugo, G., Lamonica, G., Cotroneo, A., d'Alcontres, I.S., Verzera, A., Donato, M.G., Dugo, P., Licandro, G. (Dipartimento farmaco-Chimico, Facolta di Farmacia, Universita di Messina, Italy) High resolution gas chromatography for detection of adulterations of citrus cold-pressed essential oils. *Perfumer & Flavorist*, v. 17(5): p. 57-74, 1992 (18 ref, Eng).

Type of adulterations, evaluation of purity of *Citrus* essential oils with the help of chromatography, and detection of specific adulterations have been reviewed.

9301-0118 Gopalakrishnan, S., Parvathy, P. (Department of Chemistry, Madurai Kamaraj University, P G Extension Centre, Palayamkottai 627 002, TN, India) Comparative pharmacognostic studies on the leaves of three *Ocimum* species. *Journal of Research and Education in Indian Medicine*, v. 11(3): p. 1-10, 1992 (12 ref, Eng).

Pharmacognostic characters of *Ocimum canum*, *O.gratissimum* and *O.sanctum* are compared. The anatomical features of the stems which have not been performed before are determined. The physico-chemical characters of the leaf powders are determined and compared for the first time. Thin Layer Chromatographic behaviour of the

petroleum ether, benzene, chloroform and alcohol extracts of the leaves of the three species are compared.

9301-0119 Iwai, M., Komatsu, K., Namba, T. (Research Institute for Wakan Yaku, Toyama Medical and Pharmaceutical University, 2630, Sugitani, Toyama 93001, Japan) **Pharmacognostical studies on the Codonopsis plants (3). On the botanical origin of the Chinese crude drug Dangshen derived from Sect. Erectae plants (1).** *Shoyakugaku Zasshi*, v. 46(3): p. 217-223, 1992 (10 ref, Eng, Jap).

A comparative anatomical study was conducted on the roots of 8 spices including one variety of *Codonopsis* viz. *C. pilosula*, *C. pilosula* var. *modesta*, *C. tangshen*, *C. tubulosa*, *C. nervosa*, *C. subscaposa*, *C. viridiflora*, *C. tsinglingensis* to identify the botanical origin of the crude drugs on the market. On the basis of results obtained it was indicated that 7 crude drugs in the market were derived from *C. tubulosa* and one crude drug in Xizang province was derived from *C. nervosa*.

9301-0120 Kartnig, T., Brantner, A. (Institut für Pharmakognosie der Karl-Franzens-Universität Graz, Universitätsplatz 4/1, A-8010 Graz, Österreich) **Additions to the proof of identity of plant drugs discussed for taking up into the Austrian Pharmacopoeia. Part 3.** *Scientia Pharmaceutica*, v. 60(1-2): p. 137-146, 1992 (11 ref, Eng, Ger).

Results of our microscopic and TLC investigations on different samples of 3 drugs are described. Using the summarized microscopic and TLC characteristics identity of flos *Althaea* (*Althaea officinalis*), flos *Graminis* (*Lolium perenne*), semen *Cydonia* (*Cydonia oblonga*) can be established.

9301-0121 Kartnig, T., Brantner, A. (Institut für Pharmakognosie der Karl-Franzens-Universität Graz, Universitätsplatz 411, A-8010 Graz, Österreich) **Additions to the proof of identity of plant drugs discussed for taking up into the Austrian Pharmacopoeia. Part 2.** *Scientia Pharmaceutica*, v. 60(1-2): p. 129-136, 1992 (25 ref, Eng, Ger).

Results of microscopic and TLC investigations on different samples of 3 drugs are described. Using the summarized microscopic and TLC characteristics identity of herba *Artemisiae* *Artemisia vulgaris*, herba *Capilli veneris* (*Adiantum capillus-veneris*) and radix *chichorii* (*Cichorium intybus*) can be proved.

9301-0122 Kondo, S., Mikage, M., Takano, A., Tsuda, Y. (Central Research Laboratory, Kotaro Pharmaceutical Co. Ltd., 47-3-Sugacho, Takatsuki 569, Japan) **Studies on**

the evaluation of crude drugs by means of colorimeter (2) Correlation between the color and chemical constituents of Rhubarb. *Shoyakugaku Zasshi*, v. 46(2): p. 174-178, 1992 (5 ref, Eng).

No correlation was found between botanical origin, the colors of fine powder and water extracts of the drug, and the amounts of chemical constituents such as anthraquinones, anthrones, sennoside(A,B) catechin, gallic acid and total gallic acid obtained (Hy GA) by hydrolysis. The colors of water extracts, particularly the color developed on the addition of ferric chloride, showed a high correlation with the amounts of some chemical constituents, the correlation coefficient between anthrones and b* value of the color was 0.895 and that between Gy-GA and color tone was 0.832. This suggests that this method is useful for the estimation of the amount of some chemical constituents in Rhubarb.

9301-0123 Lal, J., Nigam, S.K. (Drug Standardisation Research Unit, Central Council for Research in Unani Medicine, NBRI Campus, Lucknow 226001, UP, India) **Botanical and phytochemical standardisation of Euphorbia geniculata Orteg.** *Journal of Plant Anatomy and Morphology*, v. 5(2): p. 29-45, 1991 (10 ref, Eng).

The root, stem and leaf of *E. geniculata* are pharmacologically explored. The preliminary phytochemical values are total ash 7.56 percent acid, insoluble ash 0.2 percent, crude fibre 45.0 percent. Successive extract values are in petroleum ether (60-80) 3.45 percent, in benzene 0.87 percent, in CHCl₃ 1.20 percent. Alcohol and water soluble matters are 11.69 percent and 15.77 percent respectively. The petroleum ether, C₆H₆, CHCl₃ extractives as TLC showed 7, 4 and 4 spots with solvent systems C₆H₆:CHCl₃(1:1), C₆H₆:CHCl₃ (1:10) and CHCl₃:CH₃CO-CH₃ (1:10) respectively. NSL, New Delhi.

9301-0124 Lal, J., Nigam, S.K. (Drug Standardisation Research Unit, Central Council for Research in Unani Medicine, NBRI Campus, Lucknow 226001, UP, India) **On the pharmacognosy of Unani drugs "Gulnar farsi" and Gul-E-anar.** *Journal of Plant Anatomy and Morphology*, v. 5(2): p. 19-27, 1991 (Recd. 1992, 19 ref, Eng).

The titled drugs derived botanically from the "double flowered" (Gulnar farsi) and "single flowered", (Gul-e-anar) varieties of *Punica granatum*. Gulnar farsi is used for the treatment of diarrhoea, dysentery, leucoderma while the other drug finds use in epistaxis, biliousness and as vulnerary. A detailed pharmacognostic reveal that the two drugs resemble greatly in their histology, fluorescence characteristics and TLC but differ to some extent in their phytochemical values perhaps due to some ecofactors.

Looking to their similarities these drugs may be substituted for each other. NSL, New Delhi.

9301-0125 Lamaison, J.L., Carnat, A., Petitjean-Freytet, C., Carnat, A.P. (Laboratoire de Pharmacognosie et Phytotherapie, Faculte de Pharmacie, Universite d'Auvergne, 28, Place Henri-Dunant, F-63000 Clermont-Ferrand, France) **Study of the pharmaceutical quality of the flowering tops of hawthorn collected from Auvergne.** *Plantes Medicinales et Phytotherapie*, v. 25(4): p. 177-183, 1991 (6 ref, Eng, Fre).

Ten batches of dried flowering tops of hawthorn *Crataegus spp.* collected in Auvergne (France) were examined by the methods of French pharmacopoeia. The results are as follows foreign matter 6.6-7.0 percent, loss on drying 7.6-10 percent, ash 6.2-9 percent, flowers 20-29.2 percent, hyperoside 0.3-0.56 percent) and vitexin-2"-rhamnoside 0.4-0.54 percent. The mean level of vitexin-2"-rhamnoside-4"acetylc present in all batches was 0.49 percent. The total amount of flavonoids was about 2 percent by HPLC or by colorimetric methods. The assay method of the French Pharmacopoeia is discussed.

9301-0126 Mitra, R., Shah, N.C. (National Botanical Research Institute, Lucknow 226 001, UP, India) **Ethnobotany and pharmacognosy of Cymbopogon jwarancusa (Jones) Schult. (Graminae).** *Journal of Economic and Taxonomic Botany*, v. 15(1): p. 97-108, 1991 (28 ref, Eng).

Ethnobotany of *C. jwarancusa* and pharmacognosy of the plant with history, vernacular names, medicinal and other uses, collection, distribution, botany, macro- and microscopical characters, its behaviour with different chemical reagents and physical constant values have been described.

9301-0127 Namba, T., Komatsu, K., Iwai, M. (Research Institute for Wakan-Yaku Toyama Medical and Pharmaceutical University 2630, Sugitani, Toyama 930-01, Japan) **Pharmacognostical studies on the Codonopsis plants (2). On the botanical origin of the Chinese crude drug Dangshen and its related crude drugs derived from Sect. Codonopsis plants.** *Shoyakugaku Zasshi*, v. 46(2): p. 165-173, 1992 (22 ref, Eng, Jap).

The botanical origins of more than a hundred commercial samples of the Chinese crude drug "Dangshen" and the related drugs derived from the histological studies were made. On the basis of the distinguishable anatomical characters found, it was made clear that almost half of the crude drugs "Dangshen" were derived from *C. pilosula*, about twenty seven percent from *C. pilosula* var. *modesta* and about fourteen percent from *C. tangshen*. One sample from

Sichuan prov. was found to be from *C. subglobosa*. Most of Korean crude drug "Mansam" were from *C. pilosula* and that some of "Mansam" and all of Korean "Shasam" were from *C. lanceolata*.

9301-0128 Namba, T., Komatsu, K., Iwai, M., Xu, G.J. (Research Institute for Wakan Yaku, Toyama Medical and Pharmaceutical University, 2630, Sugitani, Toyama 930-01, Japan) **Pharmacognostical studies on the Codonopsis plants (1) On the anatomical characteristics of the root of seed Codonopsis plants.** *Shoyakugaku Zasshi*, v. 46(2): p. 156-164, 1992 (13 ref, Eng, Jap).

The anatomical characteristics and botanical identification of the roots of the plants of the genus *Codonopsis* species and one variety viz; *C. pilosula*, *C. pilosula* var. *modesta*, *C. tangshen*, *C. lanceolata*, *C. subglobosa*, have been described.

9301-0129 Noro, Y., Hisata, Y., Okuda, K., Kawamura, T. (Faculty of Pharmacy, Meijo University, 150 Yogo Toyama, Tenpaku-ku, Nagoya 468, Japan) **Application of Scanning Electron Microscopy for pharmaceutical studies (Part 1) New preparations for Scanning Electron Microscope and fine details of needle crystals in the monocotyledon.** *Shoyakugaku Zasshi*, v. 46(2): p. 115-124, 1992 (6 ref, Eng, Jap).

A simple method of preparation of microscopic specimens suitable for the observation of crystals and starch grains in plant cells with SEM was established. By using this technique, intracellular crystals in monocotyledon plant cells were observed. In most of the examined plants cells were found long and mostly bundled needle crystals which were different in the microscopic features of the pointed end portions. Their characteristic structures may be useful for the botanical identification of the original plants and studies of crude drugs.

9301-0130 Park, J.H., Chang, K.W., Komatsu, K., Namba, T.* (Research Institute for Wakan Yaku, Toyama Medical and Pharmaceutical University, 2630, Sugitani, Toyama 930 01, Japan) **Studies on the crude drug from Korea (VIII). On the folk medicine "Min Gal Pi" derived from genus Acanthopanax.** *Shoyakugaku Zasshi*, v. 46(3): p. 195-201, 1992 (19 ref, Eng, Jap).

Comparative anatomical studies were made on the branches of *Acanthopanax* species growing wild in Korea and neighbouring countries, in order to identify the botanical identity of drug Mingalpi. The species studied were *A. chiisanensis*, *A. koreanum*, *A. sessiliflorus*, *A. senticosus* forma *inermis*, *A. sessiliflorus*, *A. divaricatus* and *A. sieboldianum*.

9301-0131 Richardson, M.D., Peterson, J.R., Clark, A.M. (Department of Pharmacognosy and the Research Institute of Pharmaceutical Sciences, School of Pharmacy, The University of Mississippi, University, MS 38677, USA) **Bioactivity screenings of plants selected on the basis of folkloric use or presence of lignans in a family.** *Phytotherapy Research*, v. 6(5): p. 274-278, 1992 (24 ref, Eng).

Twenty one plant species were selected on the basis of folkloric use or the presence of lignans in the plant family to increase the likelihood of positive antiviral results. The percentage (19 percent) of species showing antiviral activity against either Rhino virus IA or Herpes Simplex virus I was within the percentage range of plants with antiviral activity found in other screenings for which a similar basis for collection was used. The plant extracts were also screened for antimicrobial activity and for toxicity to brine shrimp. Results of the screening for all biological activities were correlated with the basis for collection. The best correlation between basis for collection and biological activity was seen for species from plant families containing lignans that were collected based on folkloric use for colds and anti-Rhino viral activity.

9301-0132 Sarkar, M., Vikramaditya, Varma, P.N., Datta, P.C. (Homoeopathic Pharmacopoeia Laboratory, Ghaziabad 201 002, UP, India) **Pharmacognostic evaluation of Aphanamixis polystachya seed drug.** *Journal of Economic and Taxonomic Botany*, v. 15(1): p. 121-127, 1991 (5 ref, Eng).

Organoleptic and microscopic evaluation of *A. polystachya* seeds have been reported. The seed has been reported to be distinct as a pachychalazal seed with three quarter of seed coat composed of pachychalazal and rest part by fused testa and tegmen. Testal and tegmen regions have been reported with two zones each. It was found to contain lignin, cellulose, tannin, starch, calcium oxalate, protein, oil and terpene but devoid of sterol, alkaloid, glycoside, saponin, flavon and anthraquinone.

9301-0133 Sen, A.R., Naskar, P., Basu Roy Chowdhury, S.K. (Central Food Laboratory, Calcutta, WB, India) **Detection of Banjowan (*Seseli diffusum* Roxb, et Sm, Santapau & Wagh) in ajowan (*Trachyspermum ammi*) Linn. Sprague).** *Journal of the Institution of Chemists (India)*, v. 63(Pt.III): p. 117-118, 1991 (2 ref, Eng).

Sample of *T. ammi* (ajowan) are found to be adulterated with *S. diffusum* (benjowan) seeds. A method to detect admixture of banjowan by using amsaldehyde-sulphuric acid reagent is described. The method is simple and easily detectable.

9301-0134 Sharma, P.V. (39, Gurudhan Colony, Varanasi 221001, UP, India) **On lehas (*Linctus*) formulations.** *Ancient Science of Life*, v. 9(1): p. 18-19, 1989 (Eng).

The author renders an English translation to Lehadhyaya, (devoted to herbomineral lehas (*linctus*) formulations of the Kasyapa-Samhita, Sulhrasthana, 1-6.

9301-0135 Stuppner, H., Wagner, H. (Institut für Pharmakognosie der Universität Innsbruck, Josef-Moeller-Haus, Innrain 52, A-6020 Innsbruck, Österreich) **TLC and HPLC analysis of iridoid, cucurbitacin and phenol glycosides from *Picrorhiza kurroa*.** *Scientia Pharmaceutica*, v. 60(1-2): p. 73-85, 1992 (19 ref, Ger, Eng).

Rhizomes and roots of *P. kurroa* were characterized by TLC and HPLC finger prints of phenol, iridoid and cucurbitacin glycosides. As stationary phases for TLC analysis HPTLC silica gel 60 and RP-18 plates were used, as mobile phases solvent mixtures of chloroform/methanol (8.5/1.5, v/v) and methanol/water/acetic acid (5/5/0.1, v/v) were used respectively. Absorbance measurements (detection of reflectance) for quantitative determination of the separated substances picroside I, II and androsin were carried out in situ at 283, 270 and 267 nm using the external standard method. Commercially available samples of *P. kurroa* showed great differences in their iridoid content and their acetophenone and cucurbitacin pattern.

9301-0136 Svoboda, K.P., Deans, S.G.* (Department of Plant Sciences, Scottish Agricultural College, Auchincruive, Ayr KA6 5HW, Scotland, UK) **A study of the variability of rosemary and sage and their volatile oils on the British market: Their antioxidative properties.** *Flavour and Fragrance Journal*, v. 7(2): 81-87, 1992 (44 ref, Eng).

Rosemary and sage samples, both of dried herbs and essential oil, were obtained from various dealers and suppliers of the British market. Both species were also cultivated in Scotland for comparison of the oil characteristics. Dried samples were hydrodistilled, and all samples were analysed using GC. Herbal material was also examined under the light microscope for purity and cleanliness. There were considerable variations between the samples and the resulting problems are discussed. Scottish-grown material was of very good quality compared with the imported samples. The antioxidative properties of the various rosemary and sage samples were determined and found to be variable based on geographical location and type of processing.

9301-0137 Tanaka, T., Sakai, E., Kato, N., Takada, A., Fujii, T. (Gifu Pharmaceutical University, 5-6-1 Mitahara-

higashi, Gifu 502, Japan) **Thermal effect of the bath additive of Citrus iyo pericarp.** *Shoyakugaku Zasshi*, v. 46(2): p. 98-102, 1992 (9 ref, Eng).

C.iyo was tested for its usefulness as a bath additive by determining the oral temperature and skin temperature changes after bathing, with a thermograph and comparing the effect with that produced by Aurantii Nobilis Pericarpium of JPX II. Right after the bathing in a bath with *C.iyo*, the body temperature was higher by 0.74 degree C and 40 min after bathing.

9301-0138 Tanaka, T., Sakai, E., Nisibe, S., Sasahara, M., Taikun, Z.(Gifu Pharmaceutical University, 5-6-1, Mitahora-higashi, Gifu 302, Japan) **Pharmacognostical studies of plantaginis herba (9). On the morphology of Plantaginis Herba from China.** *Shoyakugaku Zasshi*, v. 46(3): p. 235-239, 1992 (6 ref, Jap, Eng).

According to the Pharmacopoeia of Japan, the crude drug, "Plantaginis Herba", is defined as whole plant of *Plantago asiatica* collected in the flowering season. The drug is used as a diuretic and a cough remedy in the folk medicine in Japan. The drug is prepared also from imported materials, and some of such drugs do not agree with the descriptions given in Japanese Pharmacopoeia. This paper, report that among the crude drug imported from China were the drugs derived from *P.depressa* and *P.hostifolia*.

9301-0139 Valentini, G., Arnold, N., Bellomaria, B., Arnold, H.J. (Department of Chemical Science, University of Camerino, Italy) **Study of the anatomy and of the essential oil of Origanum cordifolium, an endemic of Cyprus.** *Journal of Ethnopharmacology*, v. 35(2): p. 115-122, 1991 (10 ref, Eng).

A study was made of the anatomy and of the essential oil of *O.cordifolium* (Aucher-Eloy et Montbret ex Benth.) Vogel, an endemic subshrub of Cyprus. The anatomical study revealed the typical features of the different parts of the plant. The leaves and the flowers of this aromatic species bear glandular and non-glandular hairs on both sides of the epidermis. Gas chromatography and mass spectrometry showed that the main component of the essential oil of *O.cordifolium* is alpha-terpineol followed by gamma-terpinene, p-cymene and carvacrol.

Clinical Studies

9301-0140 Buckle, J., Acland, A., Hall, L., Hunter, P.. **Case studies.** *International Journal of Aromatherapy*, v. 4(2): p. 30-33, 1992 (Eng).

Case studies of HIV positive, colitis, insomnia and digestive disorder have been reported which were treated

with certain essential oils as body massage giving positive results.

9301-0141 Dat, D.D., Ham, N.N., Khac, D.H., Lam, N.T., Son, P.T., Van Dau, N., Grabe, M., Johansson, R., Lindgren, G., Stjernstrom, N.E. (Vietnam-Sweden Hospital of Uong Bi, The National Institute for Drug Quality Control and the Faculty of Chemistry, University of Hanoi, Vietnam) **Studies on the individual and combined diuretic effects of four Vietnamese traditional herbal remedies (Zea mays, Imperata cylindrica, Plantago major and Orthosiphon stamineus).** *Journal of Ethnopharmacology*, v. 36(3): p. 225-231, 1992 (15 ref, Eng).

Herbal remedies were widely used in Vietnam along with modern drugs. The diuretic effect of four traditional Vietnamese herbal remedies i.e. *Zea mays*, *I.cylindrica*, *P.major*, *O.stamineus* has been assessed clinically; all claimed to produce an increase of diuresis. No influence was recorded for the 12- and 24h urine output or on the sodium excretion for any of the drugs when tested under standardized conditions in a placebo controlled double-blind crossover model. The study indicates the need for critical review of plants used in traditional medicine.

9301-0142 Horrigan, C.. **Complementing cancer care III.** *International Journal of Aromatherapy*, v. 4(2): p. 28-29, 1992 (6 ref, Eng).

The use of aromatherapy as part of a holistic approach to cancer care can bring great benefits both to each the physical body and in soothing and lifting the emotions. A number of essential oils have been used and recommended: rosewood, bergamot, citronella, patchouli, chamomille, rose, geranium, neroli, lavender, rosemary, sandalwood, petitgrain, jasmine, frankincense, melissa, orange, marjoram and tea-tree.

9301-0143 Jessen, W.E.. **Forgotten memories- Olfactory stimulation in a float tank.** *International Journal of Aromatherapy*, v. 4(2): p. 17-19, 1992 (8 ref, Eng).

When the effects of chamomile essential oil were tested in a float tank subjects experienced stimulation of childhood memories and motivation for positive psychological growth.

9301-0144 Myers, R.(PO Montville Old 4560, Brisbane, Australia) **Menopause- its management and treatment.** *Australian Journal of Medical Herbalism*, v. 4(3): p. 86-90, 1992 (Eng).

Physical, physiological and psychological problems associated with menopause have been discussed. Plant drugs used to eliviate these problems are listed. Case histories of normal and a premature menopause treated with

herbal formulations are discussed. Formulations contained the following plants. *Vitex*, *Pulsatilla*, *Chionanthus*, *Glycyrrhiza*, *Arctostaphylos*, *Hydrastis*, *Zingiber*, *Crataegus*, *Dioscorea*, *Iris*, *Salvia* and *Echinacea*.

9301-0145 Nigam, U.S. (Department kayachikitsa, Government Dhanwantary Ayurvedic College, Ujjain, MP, India) **Clinical trial of Anu Tail on Nasagat Roga.** *Deerghayu International*, v. 8(4): p. 7-8, 1992 (Eng).

Anu Tail (an Ayurvedic medicated herbal oil) was instilled in a dose of four drops in each nostril of 100 patients, for 21 days. 76.9 percent were cured and 23.1 were improved. There was 100 percent relief in nasal obstruction, nasal discharge, giddiness, sleeplessness, concentrated nasal discharge, loss of smell sensation and hoarseness of voice. Headache, heaviness of head, nasal irritation, vasomotor rhinorrhoea, and watery discharge from nose were also markedly improved.

9301-0146 O'Farrell, D., Waymouth, S., Taylor, L., Munro, A.. **Case studies.** *International Journal of Aromatherapy*, v. 4(3): p. 28-30, 1992 (Eng).

Four cases of cardiac disorders viz., dilated cardiomyopathy, hypertension, arrhythmia and thrombosis, are reported to be treated with essential oil massage with successful results.

9301-0147 Pandit, R.K., Prasad, G.C. (Department of Shalya Shalakya, Institute of Medical Sciences, Banaras Hindu University, Varanasi 221 005, UP, India) **Role of thyrocap in the treatment of simple diffuse goitre: a case report.** *Journal of Research and Education in Indian Medicine*, v. 11(3): p. 21-24, 1992 (9 ref, Eng, Fre).

Effect of cap. Thyrocap containing solid extract of *Bauhinia variegata* (Kanchnar), *Commiphora mukul* (Guggulu), *Glycyrrhiza glabra* (Yashtimadhu) and *Convolvulus pluricaulis* (Shankhpushpi), 100 mg each on simple diffuse goitre has been reported with physical and bio-chemical improvement.

9301-0148 Poehlman, A. (28 Garden Tce. Underdale 5032, Adelaide, South Australia) **Tila Taila in chronic constipation: a case report.** *Deerghayu International*, v. 8(4): p. 20-21, 1992 (Eng).

Use of castor oil orally and sesame oil enema on alternate days for 3 weeks had a very good effect on a patient of chronic constipation. Further enema upto 85 days cured the patients of many other symptoms associated with vata (wind) nature of the patient..

9301-0149 Shanker, A. (R A Hospital & Research Centre, Warisaliganj (Nawada), Bihar, India) **Kofol in manage-**

ment of pertussis in rural pediatric practice. *Current Medical Practice*, v. 36(4): p. 106-108, 1992 (1 ref, Eng).

Kofol, a herbal remedy (containing Jethimadh, Bhumiringani, Baheda, Tulsi, Banafsha, Pippali, Haldi, Sunth etc.) with an appropriate antimicrobial agent in adequate dosage showed excellent clinical cure in 93 percent patients of persistent pertussis with marked appetite improvement and weight gain in 90 percent and 95 percent cases, respectively. No untoward effects were noticed during or after the therapy. NSL, New Delhi.

9301-0150 Singh, A.K., Kaushik, S.S., Singh, R.H. (Department of Kayachikitsa and Psychology, Banaras Hindu University, Varanasi 221 005, UP, India) **Pathological factors and chronic psychological stressors among control and CHD patients.** *Journal of Research and Education in Indian Medicine*, v. 11(3): p. 29-25, 1992 (30 ref, Eng).

Effect of chronic psychological stressors on quantitative variability of serum cholesterol, serum triglyceride, IDL, uric acid and fasting blood glucose in sample have been discussed on one hundred controls and case group suffering from CHD. The study reveals that psychological stressors are major factors causing CHD. In majority of the patients facing occasional and severe stressors, the serum cholesterol level was found above 351 mg percent. The chronic patients who had occasional and severe, regular, moderate to severe stressors showed LDL above 223 units and uric acid 2.7-5.8 mg percent. The fasting blood glucose in case group patients of all category was 70-126+mg percent. Most of the case patients showed fasting blood glucose level above 97 mg percent. The association between chronic psychological stressors and serum cholesterol, LDL uric acid was found to be statistically significant.

9301-0151 Singh, N.K., Singh, R.H. (Department of Kayachikitsa, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221005, UP, India) **The Kalpa method of therapy in Chronic diseases.** *Ancient Science of Life*, v. 9(1): p. 7-10, 1989 (12 ref, Eng).

In chronic diseases the Kalpa method of therapy prescribed in Ayurveda for revitalisation and over all improvement of health is discussed. The clinical trial of Arogyavardhini kalpa in chronic gastro intestinal tract (GIT) diseases, confirms the efficacy of Kalpa therapy in boosting the general health of the patients as reflected by its nutritional status etc. Clinical symptoms also improve and thus moving that the Arogyavardhini exerts multidimensional influence on the disease by virtue of its herbomineral constituents.

9301-0152 Stevenson, C.. **Orange blossom evaluation.** *International Journal of Aromatherapy*, v. 4(3): p. 22-24, 1992 (6 ref, Eng).

Heart surgery patients were subjected to foot massage using neroli oil ranging for period of a few hours to two days. Study indicates that the patients benefited, and plain oil massage was better than controls, and also use of neroli foot massage gave better results than plain massage, in a variety of ways, including reduction of anxiety and from the oils calming, relaxing and restful effects.

9301-0153 Tisserand, R.. **Success with stress.** *International Journal of Aromatherapy*, v. 4(2): p. 14-16, 1992 (16 ref, Eng).

Applications of aromatherapy in conditions of stress and mind-body interactions have been discussed. Certain essential oils eg. lavender oil, valerian oil, nutmeg are reported to be useful in stressful conditions.

9301-0154 Wan, S.X., Yang, J.Y., Liu, S.C.(Xiehe Hospital, Department of Pathology, Tongji Medical University, Wuhan 430 022, China) **Changes of T lymphocyte subsets in patients with orthopedic trauma and effects of Yipanzhu decoction on the impaired immune function.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(6): p. 340-342, 1991 (9 ref, Chi, Eng).

The effects of Yipanzhu decoction(YD) on immune function in 40 patients {2 groups, YD and normal saline(NS) group} with orthopedic trauma by taking T lymphocyte subsets as indexes were observed. The results revealed that before administration of YD the percentage of pan-T cells was reduced with an increased percentage of Ts cells and a decreased ratio between Th and Ts cells; 3 days after giving the drugs in YD group the percentage of pan-T cells was slightly increased, and the changed percentage of Ts cells and the ratio of Th/Ts cells mentioned above was recovered to normal, while in NS group all these indexes remained at abnormal range during the period. The results suggested that YD could promote the recovery of abnormal T lymphocyte subsets in traumatized patients.

9301-0155 Waray, R.S.(Faculty of Ayurvedic Medicine, University of Poona, Poona, Maharashtra, India) **Shirodhara and intoxication particularly with reference to withdrawal symptoms.** *Deerghayu International*, v. 8(4): p. 18-19, 1992 (D50, Eng).

Sesamum indicum seed oil or any suitable medicated oil was applied to the frontal region of the head of 11 patients in a thin, linear and continuous stream. About 1000 ml oil is allowed to flow down in 20-30 minutes daily for 10 days. Withdrawal symptoms of alcohol and brown sugar such as anxiety, irritability, restlessness, panicky reactions, hal-

lucinations, headache, cramps and disorientation tremors started reducing after 4-5 days of the treatment and were relieved after 10 days.

9301-0156 Woolfson, A., Hewitt, D.. **Intensive aromacare.** *International Journal of Aromatherapy*, v. 4(2): p. 12-13, 1992 (Eng).

In a study carried out in an intensive and coronary care unit, treatment with essential oils and massage reduced heart and breathing rates in most of the patients tested. Blood pressure and self-assessed pain levels also fell and patients became relaxed. Aromatherapy with essential oils showed better results. The study was conducted using lavender oil in almond oil base and was applied on the feet.

9301-0157 Zhao, L., Lin, A.M., Piao, Z.Z.(3rd Teaching Hospital, Norman Bethune University of Medical Sciences, Changchun 130 021, China) **Clinical and experimental study on cerebral thrombosis treated with antithrombotic Xinmaining.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(6): p. 327-330, 1991 (4 ref, Chi, Eng).

Antithrombotic Xinmaining were composed with Moschus, Calculus Bovis, Borneol, Radix Ligusticum, Flos Sophorae Immaturus, Radix Salviae Miltiorrhizae, Leech, etc. This preparation was suitable for treating channels and collaterals type of cerebral thrombosis. The dosage was 2~4 capsules (0.5g/capsule) oral administration twice per day, 3~4 weeks as a therapeutic coverage. The laboratory results showed that the blood-viscosity, serum viscosity, hematocrit (vol percent), RBC electrophoresis rate (microm/sec/v/cm) and platelet aggregation rate (percent) before antithrombotic Xinmaining administration were 5.82±0.82, 1.82±0.02, 52.81±6.70, 0.82±0.19 and 28.33±12.02 respectively; and those after the treatment were 4.72±0.65, 1.70±0.02, 48.76±0.40, 0.97±0.17 and 23.05±10.01 (X±S), P. The toxicological study proved that the preparation was safe, and no significant side-effect was noticed.

Pharmacology & Toxicology

9301-0158 Addy, M.E., Schwartzman, M.L.(Department of Biochemistry, University of Ghana, Legon, Ghana) **An extract of *Desmodium adscendens* inhibits NADPH-dependent oxygenation of arachidonic acid by kidney cortical microsomes.** *Phytotherapy Research*, v. 6(5): p. 245-250, 1992 (25 ref, Eng).

Cortical microsomes of human kidneys were used to study the effect of an extract of *D.adscendens* on the cytochrome P450-dependent arachidonic acid (AA) metabolism. The phenolic compounds tyramine and hordenine,

as well as triterpenoid saponins known to be present in the plant were also evaluated along with the extract, an n-butanol fraction (nBF) of the crude plant extract. The extract and the compounds were preincubated with the microsomal suspension before the addition of cofactors and radioactive AA. The products of the reactions and the unreacted AA were extracted, separated by HPLC and measured radiometrically. The total amount of radioactive AA converted, and the production of AA metabolites identified as epoxy-eicosatrienoic acids, monohydroxy-eicosatetraenoic acids, -19,20-and di-hydroxy derivatives of AA, were inhibited by nBF. The inhibition of nBF was shown to be dose-dependent. A saponin, sapogenin and the phenolic compounds present in *D.adscendens* did not inhibit this oxygenation of AA. Presence of an unidentified inhibitor for the third pathway of AA metabolism has been suggested.

9301-0159 Ahmad, F., Khalid, P., Khan, M.M., Chaubey, M., Rastogi, A.K., Kidwai, J.R. (Division of Biochemistry, Central Drug Research Institute, Post Box 173, Chattar Manzil Palace, Lucknow 226001, UP, India) **Hypoglycemic activity of Pterocarpus marsupium wood.** *Journal of Ethnopharmacology*, v. 35(1): p. 71-75, 1991 (12 ref, Eng).

Feeding the ethyl acetate-soluble fraction of an absolute ethanol extract of *P.marsupium* wood for 5 days to alloxan-diabetic rats significantly lowered blood sugar levels with a corresponding increase in the blood level.

9301-0160 Akah, P.A., Offiah, V.N., Onuogu, E. (Department of Pharmacology and Toxicology, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka, Nigeria) **Hepatotoxic effect of Azadirachta indica leaf extract in rabbits.** *Fitoterapia*, v. 63(4): p. 311-319, 1992 (13 ref, Eng).

The effect of the aqueous extract of *A.indica* on liver of rabbits was investigated, using enzyme indices of hepatic dysfunction (SGPT, SGOT and AP) as well as liver cell histology. The results revealed that the extract orally administered for 4 weeks up to a daily dose of 1746 mg/kg (i.e 1.5 ED in mice) neither caused significant rise of the enzymes nor morbid histological changes. Increasing the dose of the extract to 2328 mg/kg resulted in a significant rise of the enzymes, in a generalised necrosis and in a bile duct cellular hyperplasia. These results suggest that in high doses, the leaf aqueous extract of *A.indica* may have been some hepatobiliary toxic effects.

9301-0161 Azeem, M.A., Reddy, B.M., Appa Rao, A.V.N., Prabhakar, M.C., Prasad, M.S.K. (University College of Pharmaceutical Sciences, Kakatiya University, Warangal 506009, AP, India) **Effect of Terminalia chebula extracts**

on frog heart muscle (Na⁺, K⁺, Mg⁺⁺) ATP-ase activity. *Fitoterapia*, v. 63(4): p. 300-303, 1992 (8 ref, Eng).

Various extracts prepared from the fruit rind of *T.chebula* have shown inhibition of (Na⁺, K⁺, Mg⁺⁺) ATP-ase of frog heart muscle. The inhibition of the enzyme was found to be dose-dependent and higher than that of Ouabain.

9301-0162 Balacs, T. (PO Box 746, Hove, E.Sussex BN3 3XA, England) **Dermal crossing-Essential issues III.** *International Journal of Aromatherapy*, v. 4(2): p. 23-25, 33, 1992 (16 ref, Eng).

Skin is highly permeable to fat soluble molecules such as essential oils and vegetable oils. The upper dead cells act as reservoir where oils can remain. Vehicles carry essential oils with them and so thin oils of low viscosity are likely to enhance the absorption of essential oils into the circulation. Both warmth and massage of the area into which the oils are applied will probably enhance absorption. Hydrated skin is more permeable to the essential oils.

9301-0163 Balacs, T. (PO Box 746, Hove, E.Sussex BN3 3XA, England) **Well oiled pathways. Essential issues. IV. The pharmacokinetics of essential oils.** *International Journal of Aromatherapy*, v. 4(3): p. 14-16, 1992 (11 ref, Eng).

The course and metabolism of essential oils in the body has been explained with reference to Tarragon, Basil, Cinnamon, Vetiver oil etc. The essential organs involved are liver and kidney.

9301-0164 Barik, B.R., Bhowmik, T., Dey, A.K., Patra, A., Chatterjee, A., Joy, S., Susan, T., Alam, M., Kundu, A.B. (Department of Chemistry, University College of Science, 92 Acharya Prafull Chandra Road, Calcutta 700 009, WB, India) **Premnazole, an isoxazole alkaloid of Premna integrifolia and Gmelina arborea with anti-inflammatory activity.** *Fitoterapia*, v. 63(4): p. 295-299, 1992 (12 ref, Eng).

The occurrence of premnazole, an isoxazole alkaloid in the leaves of *P.integrifolia* and *G.arborea* is reported. It was found to reduce granuloma formation in rats (34.62 percent) and its activity was comparable to phenylbutazone (35.36 percent). Premnazole significantly lowered the weight of adrenal glands and their ascorbic acid content. The activities of acid phosphatase, GPT and GOT were reduced in serum and liver while the protein content was lowered in serum. These studies suggest that the action of premnazole is probably by controlling the activity of adrenocorticotrophic hormone.

9301-0165 Barjatiya, M.K., Mathur, R.N., Swaroop, A. (Department of Medicine, JLN Medical College, Ajmer,

Rajasthan, India) **Byssinosis in cotton textile workers of Kishangarh.** *Indian Journal of Chest Diseases and Allied Sciences*, v. 32(4): p. 215-223, 1990 (Recd. 1991, 13 ref, Eng).

Byssinosis is an occupational hazard for the workers exposed to cotton dust. In this study 616 cotton textile workers were studied; out of which 149 had byssinosis; 37(24.7 percent) had grade-1/2, 78(52.7 percent) grade-1, 25 (16.6 percent) grade-2 and 9(6.0 percent) of grade-3 byssinosis. Majority of the byssinotics were of age group between 36-40 years and had developed disease after 16 years of exposure. Disease was more common among smokers and severe, in whom consumption was more than 15 cigarettes/bidis per day for more than 10 years. Ventilatory function tests were markedly abnormal compared with non-byssinotic. On clinical examination and laboratory investigation (specially eosinophilia) and radiological investigation (x-ray chest) no positive finding was detected. The high prevalence rate of the disease in this study was apparently due to poor working conditions of the workers.

9301-0166 Bhattacharya, S., Pal, S., Nag Chaudhuri, A.K.(Division of Pharmacology, Department of Pharmaceutical Technology, PO Box 17013, Jadavpur University, Calcutta 700032, WB, India) **Pharmacological studies of the antiinflammatory profile of Mikania cordata (Burm) B.L. Robinson root extract in rodents.** *Phytotherapy Research*, v. 6(5): p. 255-260, 1992 (24 ref, Eng).

The methanolic fraction of *Mikania cordata* root extract was found to possess an inhibitory effect on carrageenin and other mediator-induced oedema; significant inhibition of protein exudation, increase in peritoneal capillary permeability and leucocyte migration in inflammatory conditions. The extract significantly inhibited both cotton pellet and carrageenin-induced granuloma formation. The extract also possessed inhibitory effects on sodium urate-induced experimental gout. A significant reduction of pyrexia was also found to occur when rats were treated with the extract.

9301-0167 Bourke, C.A., Stevens, G.R., Carrigan, M.J.(NSW Agriculture, Agricultural Research and Veterinary Centre, Forest Road, Orange, New South Wales 2800, Australia) **Locomotor effects in sheep of alkaloids identified in Australian *Tribulus terrestris*.** *Australian Veterinary Journal*, v. 69(7): p. 163-165, 1992 (14 ref, Eng).

Fresh, mature ungrazed *T.terrestris* plant material afforded beta-carboline indoleamines, viz., harmane and norharmane. These were fed at a dose of 54 mg/kg to sheep, which caused similar nervous effects to sheep as those

caused by synthetic material i.e. link paralysis. These effects are same as in the case of *T.terrestris* grazing by sheep.

9301-0168 Bourke, C.A., Carrigan, M.J.(New South Wales Agriculture, Agricultural Research and Veterinary Centre, Orange, New South Wales 2800, Australia) **Mechanisms underlying *Phalaris aquatica* "sudden death" syndrome in sheep.** *Australian Veterinary Journal*, v. 69(7): p. 165-167, 1992 (13 ref, Eng).

Twenty outbreaks of *P.aquatica* sudden death syndrome in sheep were investigated between 1981 and 1991. Potentially toxic levels of hydrocyanic acid (20-36 mg/100 gn) were measured in the 3 toxic phalaris pastures tested. The measurement of potentially toxic levels of nitrate nitrogen (2920 micro/g) in toxic phalaris pastures by others, was noted. It is suggested that phalaris sudden death syndrome could have 4 different mechanisms and these might reflect the presence of a cardio-respiratory toxin, a thiaminase and amine co-substrate cyanogen compounds and nitrate compounds.

9301-0169 Caceres, A., Saravia, A., Rizzo, S., Zabala, L., De Leon, E., Nave, F.(Center for Mesoamerican Studies on Appropriate Technology (CEEMAT), P.O.Box 1160, Guatemala City, Guatemala) **Pharmacological properties of *Moringa oleifera* 2: Screening for antispasmodic, antiinflammatory and diuretic activity.** *Journal of Ethnopharmacology*, v. 36(3): p. 233-237, 1992 (21 ref, Eng).

Hot water infusions of flowers, leaves, roots, seeds and stalks or bark of *M.oleifera* were screened to detect three pharmacologic activities in experimental models in rats. The antispasmodic activity was demonstrated using isolated duodenum, oral antiinflammatory activity by carrageenin-induced hindpaw edema and oral diuretic activity by urine output in metabolic cages. The seed infusion showed a significant inhibition of acetylcholine-induced contraction with an ED50 of 65.6 mg/ml bath concentration, inhibition of carrageenan-induced edema at 1000 mg/kg and diuretic activity at 1000 mg/kg. Some activity was also demonstrated in the roots. All doses expressed here are as equivalents of dried starting plant material.

9301-0170 Chatterjee, T.K., Chakraborty, A., Pathak, M.(Pharmacology Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Calcutta 700032, WB, India) **Effects of plant extract *Centella asiatica* (Linn.) on cold restraint stress ulcer in rats.** *Indian Journal of Experimental Biology*, v. 30(10): p. 889-891, 1992 (16 ref, Eng).

Extract of *C.asiatica* inhibited significantly gastric ulceration induced by cold and restraint stress (CRS) in rats. Antiulcer activity of plant extract was compared with

fomotidine (H₂ -antagonist) and sodium valproate. Plant extract for molidine and sodium valproate showed a dose dependent reduction of gastric ulceration. Plant extract increased brain GABA level which was also dose dependent. Pretreatment with bicucullin methiodide at the dose level of 0.5 mg/kg im, reversed the antiulcerogenic activity of both plants extract and sodium valproate. Bicuculline as such did not induce gastric ulceration in normal rat.

9301-0171 Chawla, A.S., Sharma, A.K., Handa, S.S., Dhar, K.L. (Department of Pharmaceutical Sciences, Panjab University, Chandigarh 160 014, India) **Chemical studies and antiinflammatory activity of Vanda roxburghii roots.** *Indian Journal of Pharmaceutical Sciences*, v. 54(4): p. 159-161, 1992 (6 ref, Eng).

Petroleum ether extract of *V.roxburghii* roots yielded tetracosylferulate along with other constituents. The chloroform extract afforded beta-sitosterol-D-glucoside. Petroleum ether, chloroform and methanol extracts of *V.roxburghii* roots exhibited 54.3 percent, 42.1 percent and 21.9 percent antioedema activity, respectively.

9301-0172 Chiu, K.W., Lee, Y.C., Yung, K.H. (Department of Biology, The Chinese University of Hong Kong, Hong Kong) **Bioactive substances from the Chinese daffodil, *Narcissus tazetta*.** *Phytotherapy Research*, v. 6(5): p. 231-236, 1992 (20 ref, Eng).

The cardiovascular activity of the aqueous A and ethanol extract (B) of the daffodil bulbs *N.tazetta* was examined using in vivo and in vitro preparations of normotensive rats and in the presence/absence of various blockers. These extracts (A and B) produced similar dose-dependent hypotensive responses in the anaesthetized animals. The responses induced by fraction B might be mediated via adrenergic and cholinergic receptor activation. In isolated atrial preparations, fraction A increased the atrial rate (+ve chronotropism) but not the atrial tension (inotropism). Fraction B, however, produced negative chronotropic but positive inotropic responses. Fraction B had no effect on the untreated tail vascular smooth muscle but increased the tension on AVP- precontracted helical strips.

9301-0173 Dandekar, U.P., Chandra, R.S., Dalvi, S.S., Joshi, M.V., Gokhale, P.C., Sharma, A.V., Shah, P.U., Kshirsagar, N.A. (Department of Pharmacology and Clinical Pharmacology, Seth Gordhandas Sunderdas Medical College and King Edward Memorial Hospital, Parel, Bombay 400 012, Maharashtra, India) **Analysis of a clinically important interaction between phenytoin and Shankhapushpi, an Ayurvedic preparation.** *Journal of Ethnopharmacology*, v. 35(3): p. 285-288, 1992 (9 ref, Eng).

Loss of seizure control following administration of an Ayurvedic preparation, Shankhapushpi (containing *Convolvulus pluricaulis*, *Centella asiatica*, *Nepeta hindostana*, *Nardostachys jatamansi*, *Nepeta elliptica* and *Onosma bracteatum*) has been attributed to pharmacodynamic or pharmacokinetic interaction with phenytoin. Antiepileptic activity of phenytoin reduced with the administration of Shankhapushpi.

9301-0174 De Vincenzi, M., Maialetti, F., Dessi, M.R. (Laboratorio di Metabolismo e Biochimica Patologica 1st Superiore della Sanita, Roma, Italia) **Monographs on botanical flavouring substances used in foods. Part II.** *Fitoterapia*, v. 63(4): p. 353-361, 1992 (66 ref, Eng).

Common names, synonyms, family, order, parts used, principal biologically active components, products in which used, level of use, preparations, main toxicological data, toxicological data needed and, classification and limits for parts used have been briefly described for {*Glechoma hederaceae*, *Hedeoma pulegioides*, *Heliotropium europaeum*, *Lycopersicon lycopersicum*, *Monarda punctata*, *Organum dictamnus*, *Salvia lavandulaefolia* and *Solanum dulcamara*.

9301-0175 Dixit, V.P., Verma, M., Mathur, N.T., Mathur, R., Sharma, S. (Department of Zoology and Home Science, Rajasthan University, Jaipur 302004, Rajasthan, India) **Hypocholesterolaemic and antiatherosclerotic effects of solasodine (C₂₇H₄₂O₂N) in cholesterol fed rabbits.** *Phytotherapy Research*, v. 6(5): p. 270-273, 1992 (15 ref, Eng).

Solasodine (C₂₇H₄₂O₂N), a nitrogen analogue of diosgenin reduced serum cholesterol and LDL cholesterol by 73.3 percent and 73.5 percent and prevented atherogenesis. The cholesterol/phospholipid ratio was decreased by 42.02 percent while the HDL ratio was raised significantly. Solasodine treatment prevented the accumulation of cholesterol in the liver and aorta and regressed plaque size in the thoracic and abdominal aorta. Faecal excretion of cholesterol and phospholipids was significantly increased suggesting that modulation of absorption was affected.

9301-0176 Ericksen, M. (Santo Fe, New Mexico) **Canine cancer.** *International Journal of Aromatherapy*, v. 4(3): p. 12-13, 1992 (Eng).

A dalmatian suffering from rectal cancer and severe ulcerated wounds was treated with various essential oils, and restored to health. The essential oils used for ulcers were Roman camomile, *Helichrysum*, *Artemisia arborescens*, German camomile, tea tree oil, *Eucalyptus citriodora* and

lemon. For cancer, a blend of bitter almond oil, *Calendula/comfrey* was used.

9301-0177 Fujimoto, T., Nose, M., Takeda, T., Ogihara, Y., Nishibe, S., Minami, M. (Faculty of Pharmaceutical Sciences, Nagoya City University, Tanabe-dori, Mizuhoku, Nagoya 467, Japan) **Studies on the Chinese crude drug "Luoshiteng" II. On the biologically active components in the stem part of Luoshiteng originating from *Trachelospermum jasmioides*.** *Shoyakugaku Zasshi*, v. 46(3): p. 224-229, 1992 (15 ref, Eng, Jap).

Aqueous extracts from two kinds of the Chinese crude drug "Luoshiteng" one prepared from leaves and stems of *T.jasminoides* and the other prepared from the leaves and stems of *Ficus pumila*, were tested for their biological activities. A relaxation effect on the histamine-induced contraction of tracheal muscles in guinea pig were observed in the aqueous extract from the stems of *T.jasminoides* from which arctigenin, matairesinol, trachelogenin and nortrachelogenin were isolated as biologically active components. In addition, arctigenin and nortrachelogenin strongly inhibited the superoxide production.

9301-0178 Fujimoto, Y., Wang, H., Kirisawa, M., Satoh, M., Takeuchi, N. (College of Pharmacy, Nihon University, 7-7 Narashinodai, Funabashi, Chiba 274, Japan) **Acetylenes from *Panax quinquefolium*.** *Phytochemistry*, v. 31(10): p. 3499-3501, 1992 (3 ref, Eng).

Two new C17-polyacetylenes and a C14-polyacetylene were isolated from dried roots of *P.quinquefolium*. Their structures were determined by their ¹H NMR, ¹³C NMR and mass spectral data. The cytotoxic activity of C17-polyacetylenes against leukemia cells (L 1210) was ca 20 times that of the C14-polyacetylene.

9301-0179 Garg, A.K., Agarwal, D.K., Singh, S.D., Nath, K. (Animal Nutrition Division, Indian Veterinary Research Institute, Izatnagar 243122, UP, India) **Growth and spermatogenesis in rats fed solvent extracted, water washed and untreated neem (*Azadirachta indica* A.Juss) seed kernel cake.** *International Journal of Animal Sciences*, v. 7(2): p. 223-225, 1992 (19 ref, Eng).

Forty-five weaned male rats were divided in five equal groups and fed rations containing fourteen percent of either groundnut cake, neem seed kernel cake (NSKC), water washed NSKC, solvent extracted NSKC or solvent extracted cum water washed NSKC along with other conventional feeds for 50 days. The results showed that none of the above treatments could make NSKC free from bitter/toxic responsible for adverse effect on growth and reproductive development in rats. It was suggested that a

fertility test trial is essential before recommending water washed NSKC in the diet.

9301-0180 Grazziotin, J.D., Schapoval, E.E.S., Chaves, C.G., Gleye, J., Henriques, A.T. (Curso de Pós-Graduação em Ciências Farmacêuticas-UFRGS, Av. Ipiranga 2752, 90610-Porto Alegre, RS, Brazil) **Phytochemical and analgesic investigation of *Tabebuia chrysotricha*.** *Journal of Ethnopharmacology*, v. 36(3): p. 249-251, 1992 (11 ref, Eng).

The ethanol extract of the ground driedwood of *T.chrysotricha* syn. *Tecoma chrysotricha* afforded the naphthaquinone lapachol, while the CHCl₃ extract afforded 5-hydroxy-2(1-hydroxy-ethyl)naphtho-2,3-b furan-4,9 dione and dehydro- α -lapachone. The ethanolic extract and lapachol were subjected to biological assay, showed analgesic activity which is in conformity with its popular use however, more extensive evaluation and toxicity evaluation is required before putting it as a phytotherapeutic agent.

9301-0181 Gromek, D., Kisiel, W., Klodzinska, A., Chojnacka-Wojcik, E. (Institute of Pharmacology, Polish Academy of Sciences, 12 Smetna Street, Cracow, Poland) **Biologically active preparations from *Lacutuca virosa* L..** *Phytotherapy Research*, v. 6(5): p. 285-287, 1992 (9 ref, Eng).

The crude preparations from *L.virosa*, lactucin and jacquinelin were investigated pharmacologically in Albino-Swiss mice. The crude preparation P-1, P-2, P-3 and lactucin, but not jacquinelin showed sedative and analgesic properties. the most active of them was preparation P-2 which at a dose of 2mg/kg reduced the spontaneous locomotor activity and at a dose of 15 mg/kg produced an analgesic effect. Jacquinelin, 8-desoxylactucine, 11 β , 13-dihydrolactucin and lactuside A were isolated from this preparation.

9301-0182 Hossain, M.Z., Shibib, B.A., Rahman, R. (Department of Biochemistry, University of Dhaka, Dhaka, Bangladesh) **Hypoglycemic effects of *Coccinia indica*: Inhibition of key gluconeogenic enzyme, glucose-6-phosphatase.** *Indian Journal of Experimental Biology*, v. 30(5): p. 418-420, 1992, 1992 (19 ref, Eng).

C.indica, (locally known as telakucha) leaves suspension was fed orally to male normal-fed and 48-hr starved rats, the blood glucose was lowered 21 percent in normal-fed and 24 percent animals respectively. Starvation had induced a 3-fold increase in the activity of glucose-6-phosphatase and this activity was depressed 19 percent by extract feeding while basal activity of the enzyme in normal-fed rats remained unaffected. Consistent with the depression of

glucose-6-phosphatase, urea cycle enzyme arginase was also depressed 21 percent and 12 percent in the liver of 48 hr-starved and normal-fed animals respectively. Unlike glucose-6-phosphatase, starvation induced levels of gluconeogenic enzymes alanine aminotransferase and aspartate aminotransferase were not affected by *Coccinia* extract. These results suggest that the hypoglycemic effect of *C.indica* is partly due to the repression of the key gluconeogenic enzyme glucose-6-phosphatase.

9301-0183 Hrones, I. **Biological effects of anthraquinones.II. Mutagenic, carcinogenic and neoplastic action. Effect on the immunity system.** *Ceskoslovenska Farmacie*, v. 41(3): p. 108-111, 1992 (38 ref, Cze).

Only title translated.

9301-0184 Huang, Y.S., Zhang, J.T.(Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100050, China) **Antioxidative effect of three water soluble components isolated from *Salvia miltiorrhiza* in vitro.** *Acta Pharmaceutica Sinica*, nv. 27(2): p. 96-100, 1992 (4 ref, Chi, Eng).

All the components from *S.miltiorrhiza* were found to inhibit both NADOH-vit C and Fe 2+-cystein induced lipid peroxidation in rat brain, liver and kidney microsomes in vitro. The order of their inhibitory effect is as follows: salvianolic acid A, salvianolic acid B and rosmarinic acid. The inhibitory effect on lipid peroxidation induced by NADPH-vit C was more than that induced by Fe2+cysteine. In addition, the three compounds lowered the production of superoxide anion radical (O₂⁻) in xanthine-xanthine oxidase system. The order of their potency was similar to that in antilipoperoxidation, which indicated their strong antilipoperoxidant activity in vitro, which may be partly their through scavenging O₂.

9301-0185 Hussain, M.S., Chandrasekhara, N.(Department of Food Chemistry, Central Food Technological Research Institute, Mysore, Kamataka, India) **Effect of curcumin on cholesterol gall-stone induction in mice.** *Indian Journal of Medical Research*, v. 96B: p. 288-291, 1992 (23 ref, Eng).

Feeding a lithogenic diet supplemented with 0.5 per cent curcumin for 10 week reduced the incidence of gall-stone formation to 26 percent. Biliary cholesterol concentration was also significantly reduced by curcumin feeding. A dose-response study with 0.2, 0.5 and 1.0 percent curcumin supplemented lithogenic diets showed that 0.5 percent curcumin was more effective than a diet with 0.2 or 1.0 percent curcumin.

9301-0186 Ibrahim, I.A., Khalid, S.A., Omer, S.A., Adam, S.E.I. (Department of Veterinary Medicine, Pharmacology and Toxicology, University of Khartoum, P O Box 32, Khartoum North, Sudan) **On the toxicology of *Azadirachta indica* leaves.** *Journal of Ethnopharmacology*, v. 35(3): p. 267-273, 1992 (16 ref, Eng).

A depression in body weight gain and efficiency of feed utilization was observed in brown Hisex chicks fed on diets containing 2 percent and 5 percent *A.indica* leaf from their 7th to 35th day of age. The main clinicopathological changes were, increase in lactic dehydrogenase glutamic oxaloacetic transaminase and alkaline phosphatase activities and uric acid and bilirubin concentrations and decrease in the total protein levels in serum. Changes in the values of erythrocyte count, haemoglobin concentration, packed cell volume, mean corpuscular volume and mean corpuscular haemoglobin were remarkable and associated with yellow discoloration on the legs and combs and hepatonephropathy. Tissue recovery was incomplete 2 weeks after removal from the experimental diets.

9301-0187 Julkunen-Titto, R., Meier, B.(Department of Biology, University of Joensuu, Box 111, SF 80101 Joensuu 10, Finland) **The enzymatic decomposition of salicin and its derivatives obtained from Salicaceae species.** *Journal of Natural Products*, v. 55(9): p. 1204-1212, 1992 (21 ref, Eng).

The enzymatic catalysis of the decomposition of Salicaceae phenolic glucosides was tested using almond beta-glucosidase and rabbit and porcine liver esterases. The beta-glucosidase catalyzed the complete hydrolysis of salicin and salicortin, yielding saligenin and glucose. Salicortin also produced (+)-6-hydroxycyclohexen-2-one (6-HCH). The acyl-glucosides were not decomposed by the beta-glucosidase. Both esterases catalyzed the decomposition of tremulacin, salicortin, and 2'-O-acetylsalicortin, releasing tremuloidin, salicin, and 2'-O-acetylsalicin as the main products, accompanied by 6-HCH and catechol. Tremuloidin and 2'-O-acetylsalicin were quite stable under the esterase hydrolysis, and salicin was not decomposed at all.

9301-0188 Kailash, P., Varalakshmi, P.(Department of Medical Biochemistry, ALMPG Institute of Basic Medical Sciences, University of Madras, 600113, TN, India) **Effect of banana stem juice on biochemical changes in liver of normal and hyperoxaluric rats.** *Indian Journal of Experimental Biology*, v. 30(5): p. 440-442, 1992 (33 ref, Eng).

Influence of stem extract of banana *Musa paradisiaca* was studied on glycollic acid oxidase (GAO) and lactate dehydrogenase enzymes, calcium, phosphorus, oxalate and glycollic acid in liver tissues of sodium glycollate-induced

hyperoxaluric rats. Activity of GAO was significantly lowered in the extract-treated rats compared to that of the glycollate-fed rats. LDH increased significantly in glycollate administered rats when compared with the extract-treated rats. The levels of calcium, phosphorus, oxalate and glycollic acid during hyperoxaluric state showed remarkable alterations in liver tissue.

9301-0189 Kan, S., Taniyama, K. (Department of Pharmacology, 2 Nagasaki University School of Medicine 12-4 Sakamoto-machi, Nagasaki 852, Japan) **Mechanism of inhibitory actions of *Geranium thunbergii*, tannic acid and geraniin on the motility of rat intestine.** *Shoyakugaku Zasshi*, v. 46(3): p. 246-253, 1992 (16 ref, Eng).

Effects of *G.thunbergii*, *G.nepalense*, tannic acid and geraniin on the intestinal motility and acetylcholine (ACh) release were studied by using the isolated rat intestine. *G.thunbergii*, *G.nepalense*, tannic acid and geraniin inhibited the ACh- and histamine-induced contractions of the small and large intestine, but not the Ca^{2+} -induced contraction in the absence of external Ca^{2+} and not the Ba^{2+} -induced contraction either in the absence or presence of external Ca^{2+} . The potency of *G.nepalense* was between those of *G.thunbergii*, (white) and *G.thunbergii* (red), both on the small and large intestines. Geraniin inhibited the Ca^{2+} -dependent high K^{+} -evoked release of 3H-ACh from the ileum preloaded with 3H-choline. Thus, above drugs may reduce the intestinal contractility by interfering with the cholinergic neuron and receptor located on the intestinal smooth muscle.

9301-0190 Kashman, Y., Gustafson, K.R., Fuller, R.W., Cardellina, J.H., McMahon, J.B., Curreus, H.J., Buckheit, R.W., Hughes, S.H., Cragg, G.H., Boyd, M.R. (Laboratory of Drug Discovery Research Development, DTP, DCT, NCI, Frederick Cancer, R&D Center, Frederick, Maryland, USA) **The calanolides, a novel HIV inhibitory class of coumarin derivatives from the tropical rain forest tree, (*Calophyllum lanigerum*).** *Journal of Medicinal Chemistry*, v. 35(15): p. 2735-2743, 1992 (35 ref, Eng).

Eight new compounds were isolated by anti-HIV bioassay-guided fractionation of an extract of *C.lanigerum*. The structures calanolide A, 12-acetoxycalanolide, 12-methoxycalanolide A, calanolide B, 12-methoxy calanolide, calanolide C and related derivatives were solved by spectroscopic analyses. Calanolides A and B were completely protective against HIV-1, replication and cytopathicity (EC₅₀ values of 0.1 microM and 0.4 microM respectively) but were inactive against HIV-2. Some of the related compounds also showed evidence of anti-HIV-1 activity. Calanolides are reported to be HIV-1 specific RT inhibitors. Calanolide A was active against AZT resistant

G-9106 strain of HIV-1 and pyridinone-resistant A-17 strains. Calanolides represent a novel new anti HIV chemotype for drug development, since A-17 virus is highly resistant to previously known HIV-1 specific non nucleoside, RT inhibitors, ex TIBO; BI-RG-587; L693,593.

9301-0191 Kiho, T., Watanabe, T., Nagai, K., Ukai, S. (Gifu Pharmaceutical University, 6-1, Mitahora-higashi 5-chome, Gifu 502, Japan) **Hypoglycemic activity of polysaccharide fraction from rhizome of *Rehmannia glutinosa* Libosch. f. *hueichingensis* Hsiao and the effect on carbohydrate metabolism in normal mouse liver.** *Yakugaku Zasshi*, v. 112(6): p. 393-400, 1992 (27 ref, Jap, Eng).

The ethanol precipitate fraction (RG-WP) obtained from the hot water extract from rhizome of *Rehmannia glutinosa* f. *hueichingensis* mainly composed of pectin-like polysaccharide exhibited hypoglycemic activity in normal and streptozotocin-induced mice by intraperitoneal administration of the fraction. The results obtained after chemical modification and proteinase treatments of RG-WP suggest that the activity exists in the polysaccharide moiety. Administration of RG-WP to normal mice significantly increased the activities of hepatic glucokinase and glucose-6-phosphatase dehydrogenase, but decreased those of hepatic glucose-6-phosphatase and phosphofructokinase. RG-WP stimulated the secretion of insulin and reduced the glycogen content in the liver of normal mouse.

9301-0192 Kulkarni, S.K., Verma, A. (Pharmacology Division, Department of Pharmaceutical Sciences, Punjab University, Chandigarh 160014, India) **Prevention of development of tolerance and dependence to opiate in mice by BR-16A (Mentat R), a herbal psychotropic preparation.** *Indian Journal of Experimental Biology*, v. 30(10): p. 885-888, 1992 (10 ref, Eng).

Chronic treatment with BR-16A (20-500 mg/kg) followed by saline on days 1-9 failed to produce any significant change in tail-flick latency from the saline-pretreated group in mice. Repeated administration of BR-16A (20-500 mg/kg) for 9 days however, attenuated the development of tolerance to the analgesic effect of morphine (10 mg/kg). BR-16A (20-500 mg/kg) also suppressed, in a dose dependent manner, the development of morphine dependence as assessed by naloxone (2mg/kg), precipitated withdrawal on day 10 of testing.

9301-0193 Lee, I.R., Kim, J.S., Lee, S.H. (College of Pharmacy, Ewha Women's University, Seoul 132-714, Korea) **Pharmacological activities of leaves of *Hedera rhombea* Bean.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 34-42, 1992 (9 ref, Eng, Kor).

The methanol and butanol fractions of *H.rhombea* extracts showed analgesic activity but no anticonvulsant activities. Antiinflammatory activity was found in the methanol, butanol and ether fractions by carrageenin induced edema test.

9301-0194 Lohiya, N.K., Goyal, R.B.(Reproductive Physiology Section, Department of Zoology, University of Rajasthan, Jaipur 302004, Rajasthan, India) **Antifertility investigations on the crude chloroform extract of *Carica papaya* Linn. seeds in male albino rats.** *Indian Journal of Experimental Biology*, v. 30(11): p. 1051-1055, 1992 (20 ref, Eng).

The crude extract of *C.papaya* seeds (5 mg/animal/day, p.o 20,40, and 60 days) reduced fertility to zero percent by 40-60 days of treatment. Suppression of Cauda epididymal sperm motility was the most pronounced effect of the drug administration. Scanning electron microscopic observations revealed treatment induced abnormalities in sperms.Cauda epididymal and testicular sperm counts decreased following treatment. Clinical parameter did not show any alterations. Results suggest that the contraceptive effects of chloroform extract of papaya seeds are mainly post testicular in nature without influencing toxicological profile and libido of the animals.

9301-0195 Lu, F.E., Zhang, J.H., Li, M.Z.(Institute of Integration of TCM-WM, Tongji Medical University, Wuhan 430 030, China) **The scavenging effect of Re-Du-Qing on free radicals.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(6): p. 362-363, 1991 (4 ref, Chi, Eng).

The lipid peroxides(LPO) in sera and liver homogenates of rabbits in RE-Du-Qing group were lower than those of rabbits in normal saline group, accessed to the LPO level of rabbits in normal control group. In in vitro experiment, LPO of mitochondria in Re-Du-Qing group (1.50+/-0.43 n mol MDA/mg protein) decreased when compared with that of endotoxin group and of control group (2.23+/-0.75,). The findings of both in vivo and in vitro experiments showed that Re-Du-Qing possesses scavenging effect on free radicals. In view of the detoxification mechanism of Re-Du-Qing, in addition to inhibiting bacteria and degrading endotoxin, the scavenging effect of Re-Du-Qing on free radicals are also included.

9301-0196 Ma, R.D., Yu, L.J., Wang, Y.Q. , Nishino, H., Takayasu, J.(Department of Biochemistry, Shaanxi Provincial Academy of Traditional Chinese Medicine and Pharmacology, Xian 710 003, People's Republic of China) **Potent inhibitory effects of tubeimoside 1 isolated from the bulb of *Bolbostemma paniculatum* (Maxim) Franquet on inflammatory ear oedema and tumor promotion**

in mice. *Chinese Science Bulletin*, v. 37(7): p. 602-605, 1992 (13 ref, Eng).

Topical application of tubeimoside 1 isolated from the bulbs of *B.paniculatum* inhibited in vitro tumour promoting activity induced by DMBA and TPA in experimental mice.

9301-0197 Mackie, J.T., Rahaley, R.S. , Bennett, R.(Department of Agriculture, Regional Veterinary Laboratory, PO Box 388, Benalla, Victoria 3672, Australia) **Lupinosis in yearling cattle.** *Australian Veterinary Journal*, v. 69(7): p. 172-173 , 1992 (8 ref, Eng).

A group of 80 Murray Grey heifers (9-12 months old) had access to *L.angustifolius* cv. *uniharvest* stubble during February and March 1988. The stubble had been burnt, and rain and warm weather followed. 70 Of the heifers were clinically effected, 35 died due to hepatic damage. Hence caution is needed when allowing cattle to graze lupin stubbles.

9301-0198 Malhotra, R., Sadhoo, A.K., Dhar, G.L.(Department of Physiology, Govt. Medical College, Jammu 190001, JK, India) **Acute effects of cigarette smoking on some dynamic lung function.** *Indian Journal of Physiology and Allied Sciences*, v. 46(2): p. 68-, 1992 (9 ref, Eng).

Acute effects of cigarette smoking on various respiratory parameters were studied in 39 smokers and 29 non-smokers. It was observed that both the groups showed a significant decline in all the lung function test performed; which was probably due to the reflex bronchospasm caused by vagal stimulation due to particulate matter in tobacco (*Nicotiana tobacum* smoke. NSL, New Delhi.

9301-0199 Malini, T., Vanitakumari, G.*(Department of Zoology, Bharathiar University, Coimbatore 641046, TN, India) **Antifertility effects of beta-sitosterol in male albino rats.** *Journal of Ethnopharmacology*, v. 35(2): p. 149-153 , 1991 (18 ref, Eng).

The effects of beta-sitosterol on fertility, epididymal sperm counts and testicular and accessory reproductive organ weights were evaluated in male albino rats. The effects were studied at two dosages (0.5 and 5 mg/kg per day per rat subcutaneously) for 16, 32 and 48 days. The antifertility effect of beta-sitosterol was pronounced only at the high dose level, but there was a significant decrease in testicular weight and sperm concentrations after long-term treatment with the low dose of beta-sitosterol. The weights of all accessory sex tissues except caput epididymis increased followed low dose sitosterol treatment. High dose treatment reduced the sperm concentrations as well as the weights of testis and accessory sex tissues in a time-dependent manner. Withdrawal of treatment for 30 days restored

only the weights of accessory sex tissues to near normal conditions.

9301-0200 Mannila, E., Talvitie, A. (Department of Chemistry, University of Jyväskylä, Surfontie 9, SF-40500 Jyväskylä, Finland) **Stilbenes from *Picea abies* bark.** *Phytochemistry*, v. 31(9): p. 3288-3289, 1992 (29 ref, Eng).

The antileukaemic activity of some stilbenes from the bark of *P. abies* was tested. Among them, the main stilbene, isorhapontin, showed antileukaemic activity. The approximate relative percentage of five major stilbenes in the bark was determined by reversed phase HPLC.

9301-0201 Medeiros, M.A.S., Medeiros, F.C., Peixoto, M.M.L.V., Silva, J.C.R., Rao, V.S.N., Matos, M.E.O., Craveiro, A.A. (Department of Physiology and Pharmacology, Health Sciences Center, Federal University of Ceara, P.B.657, 60000, Fortaleza, CE, Brazil) **Hypoglycemic activity of *Bignonia tuiira* aqueous extract in rats.** *Fitoterapia*, v. 63(4): p. 363-364, 1992 (2 ref, Eng).

An aqueous extract prepared from the leaves of *B. tuiira* was tested for hypoglycemic activity in both normal and diabetic rats. Pre-treatment with plant extract (10 ml/kg of a 10 percent solution orally for 4 consecutive days) lowered the blood sugar levels by 58.7 percent in alloxan-induced diabetic rats. However, it was found to be ineffective in decreasing the blood sugar levels of normal rats, isolation of active principle and its identification is in progress.

9301-0202 Melis, M.S. (Departamento de Biologia, Setor de Fisiologia, Faculdade de Filosofia, Ciencias e Letras de Ribeirao Preto, Universidade de Sao Paulo, Ribeirao Preto; CEP 14049 Sao Paulo, Brazil) **Stevioside effect on renal function of normal and hypertensive rats.** *Journal of Ethnopharmacology*, v. 36(3): p. 213-217, 1992 (22 ref, Eng).

Physiological and pharmacological experiments have suggested that stevioside obtained from the leaves of *Stevia rebaudiana* acts as a typical systemic vasodilator. The effect of stevioside on renal function in both normal and with experimental renal hypertension rats was evaluated using clearance techniques. Stevioside provoked hypotension, diuresis and natriuresis in both the normal and hypertensive rats. Normal rats presented an increase in renal plasma flow (RPF) and glomerular filtration rate (GFR) constant following stevioside administration. The last effect is in part due to vasodilation of both the afferent and efferent arterioles. Moreover, stevioside infusion in hypertensive rats caused an increase in RPF and GFR. These data are consistent with impairment of a renal autoregulation mechanism in this experimental hypertensive model.

9301-0203 Mishra, A.K., Kishore, N., Dubey, N.K., Chansouria, J.P.N. (Herbal Pesticide Laboratory, Centre of Advanced Study in Botany, Banaras Hindu University, Varanasi-221005, UP, India) **An evaluation of the toxicity of the oils of *Cymbopogon citratus* and *Citrus medica* in rats.** *Phytotherapy Research*, v. 6(5): p. 279-281, 1992 (10 ref, Eng).

The effect of chronic ingestion of a diet treated with different concentrations of essential oils of *C. citratus* and *C. medica* on body weight, diet consumption, haemoglobin, total and differential leucocyte count, blood glucose, protein, cholesterol and urea levels and glutamic oxalacetic transaminase, glutamic pyruvic transaminase and alkaline phosphatase activity was investigated in albino rats. Rats in the treated groups showed more pronounced increase in body weight in comparison to control rats after 60 days. The rats of the treated group consumed more diet than those of the control group. The haemoglobin percentage, phosphatase did not differ significantly between the rats of control and treated groups.

9301-0204 Mok, J.S.L., Chang, P., Lee, K.H., Kam, T.S., Goh, S.H. (Institute for Advanced Studies, University of Malaya 59100 Kuala Lumpur, Malaysia) **Cardiovascular responses in the normotensive rat produced by intravenous injection of gambirine isolated from *Uncaria callophylla* Bl. ex Korth.** *Journal of Ethnopharmacology*, v. 36(3): p. 219-223, 1992 (9 ref, Eng).

Among several alkaloids, including dimeric indoles, isolated from *U. callophylla* gambirine unique to this plant, has been found to be another hypotensive principle from the plant. Intravenous injections of gambirine in the dose range of 0.2 to 10.0 mg/kg caused a dose-related fall in both systolic and diastolic blood pressures as well as heart rate. At all doses gambirine showed a prompt onset of action and at the higher doses (5.0-10 mg/kg), marked persistence of hypotension accompanied by severe bradycardia were observed. In addition, higher doses of gambirine produced a more marked decrease in diastolic than systolic pressure while at lower doses both decreased equally. It is suggested that the hypotensive effect of gambirine may be peripheral in origin and is associated at least in part, with a cardiac action.

9301-0205 Morimitsu, Y., Morioka, Y., Kawakishi, S. (Department of Food Science and Technology, Faculty of Agriculture, Nagoya University, Nagoya 464-01, Japan) **Inhibitors of platelet aggregation generated from mixtures of *Allium* species and/or S-alk(en)nyl-L-cysteine sulfoxides.** *Journal of Agricultural and Food Chemistry*, v. 40(3): p. 368-372, 1992 (18 ref, Eng).

From the mixing of onion (*Allium cepa*) juice with S-alk(en)yl-L-cysteine sulfoxides or other *Allium* species, thiopropanal S-oxide, the lachrymatory factor of onion, reacted with other sulfenic acids produced by the action of CS-lyase(alliinase). Using this reaction, the AC series/cepaenes so far isolated from onion extracts as inhibitors of platelet aggregation and their homologues could be obtained in good yield. Hence, the mixing of onion with rakkyo (*A.chinense*) or garlic (*A.sativum*) resulted in marked increases in the inhibitory activity of platelet aggregation compared to the inhibitory activity of onion extracts. The antithrombotic compounds isolated from these mixtures were alpha-sulfinyl disulfides and thiosulfinates. Thiopropanal S-oxide was considered to play an important role in the formation of bioactive alpha-sulfinyl disulfides.

9301-0206 Murayama, M., Mori, T., Bando, H., Amiya, T. (Research Section, Sanwa Shayaku Co. Ltd., 6-1, Hiraide Kogyo Danchi, Utsunomiya, Tochigi 321, Japan) **Studies on the constituents of Aconitum species. IX. the pharmacological properties of pyro-type aconitine alkaloids, components of processed aconite powder 'Kako-bushimatsu; analgesic, antiinflammatory and acute toxic activities.** *Journal of Ethnopharmacology*, v. 35(2): p. 159-164, 1991 (9 ref, Eng).

Eight pyro-type aconitine alkaloids contained in the processed aconite powder 'Kako-bushi-matsu' were studied for their analgesic, antiinflammatory and acute toxic actions. All these compounds showed significant analgesic and antiinflammatory actions. Among the pyro-type alkaloids, 16-epi-pyrojesaconitine and pyrojesaconitine were the most potent analgesics. However, pyro-type aconitine alkaloids had very low toxicity, and the decreasing rates of the toxicity in changing from the parent alkaloids to the pyro-type aconitine alkaloids were much larger than those relating to the analgesic activity. eight pyro-type aconitine alkaloids were found to inhibit the carrageenin-induced hind paw edema at 2 to 6 h after the carrageenin subplantar injection. Consequently, it was demonstrated that the pyro-type aconitine alkaloids produced through the processing of raw aconite roots. 'Bushi', have a role in the medicinal effects of the processed aconite powder 'Kakobushi-matsu'.

9301-0207 Okutomi, T., Nishizawa, T., Inagawa, H., Morikawa, A., Takeuchi, S., Soma, G.I., Mizuno, D.I. (Biotechnology Research Center, Teikyo University, Nogawa, Miyamae-ku, Kawasaki 216, Japan) **Homeostasis as regulated by activated macrophage. IV. Analgesic effect of LPSw, a lipopolysaccharide of wheat flour.** *Chemical and Pharmaceutical Bulletin*, v. 40(4): p. 1001-1003, 1992 (16 ref, Eng).

The effect of LPSw, a lipopolysaccharide from a water extract of wheat flour, on pain response was investigated 10 ng-10 microg/mouse i.v. This effect reached its maximum 1.5-3h after the LPSw inoculation and was detectable even after 8h. The analgesic effect of LPSw was inhibited by i.v. injection of naloxone and also beta-endorphin was detected in serum and brain tissue following injection of LPSw. Preliminary clinical trials were done in which LPSw was administered percutaneously to relieve the pain of patients with herpes. The results showed that pain was relieved by this application. LPSw may be the best analgesic drug so far known, since it induces the endogenous mediator of analgesia, beta-endorphin.

9301-0208 Olayinka, A.O., Onoruvwe, O.*, Lot, T.Y. (Department of Pharmacognosy and Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmaceutical Sciences, University of Jos, P.M.B. 2084 Jos, Nigeria) **Cardiovascular effects in rodents of the methanolic extract of the stem bark of Khaya senegalensis A.Juss.** *Phytotherapy Research*, v. 6(6): p. 282-284, 1992 (12 ref, Eng).

The methanolic bark extract of *K.senegalensis* increased the blood pressure of chloralose anaesthetized rats. The increase in rate and force of contraction of isolated, spontaneous rabbit atria evoked by the extract were dose dependent and less pronounced than those produced by isoprenaline. The chronotropic effects of the extract and isoprenaline were antagonized by propranolol which also abolished the ionotropic effect of the extract and antagonized isoprenaline-induced ionotrophy. The vasoconstrictor effect of the extract observed with isolated spiral strips of rabbit aorta was dose dependent, less potent than norabrenaline and was abolished by prazosin. The hypertensive effect of the methanolic bark extract of *K.senegalensis* partly due to the stimulation of beta-receptors and alpha-adrenoceptors has been suggested.

9301-0209 Page, J.E., Balza, F., Nishida, T., Towers, G.H.N.* (Botany Department, University of British Columbia, 6270-University Blvd, Vancouver B.C., Canada V6T 1Z4) **Biologically active diterpenes from *Aspilia mossambicensis*, a chimpanzee medicinal plant.** *Phytochemistry*, v. 31(10): p. 3437-3439, 1992 (20 ref, Eng).

Two potent stimulators of uterine contraction, the diterpenes kaurenoic and grandiflorenic acids, were isolated from leaves of *A.mossambicensis*. Their presence supports a hypothesis that wild chimpanzees consume *Aspilia* species for their pharmacological properties and may explain why female chimpanzees consume *Aspilia* leaves more frequently than do males. Thiarubines were not present in any of the leaf samples collected in Mahale or Gombe National

Parks, Tanzania, although these antifungal and nematocidal dithianes were found in significant amounts in roots.

9301-0210 Pan, Sheng Li, Kan, L., Gang, S. (Faculty of Pharmacognosy, School of Pharmacy, Shanghai Medical University, Shanghai, China) **Studies on Chinese medicinal herbs increasing the rate of orthodontic tooth movement.** *Shoyakugaku Zasshi*, v. 46(2): p. 131-135, 1992 (5 ref, Eng).

Nine Chinese herbs were examined for their effects on orthodontic tooth movement. *Hosta ventricosa*, increased the rate of movement by 2.11 times, and *Salvia miltiorrhiza*, *Ligusticum chuanxiong* and *Achyranthus bidentata* by 1.6 times. Histological observations showed that the bone resorption on the pressure side of moving tooth was more obvious in the treated animals than the control. Besides, *H.ventricosa* and *Drynaria fortunei* investigated, the osteoblasts caused more bone deposition on the tension side of moving tooth.

9301-0211 Patil, S., Kanase, A., Kulkarni, P.H. (Cell Biology Section, Department of Zoology, Shivaji University, Kolhapur 416004, Maharashtra, India) **Studies on protective and curative action of Ayurvedic drugs on duodenal ulcers in albino rats.** *Deerghayu International*, v. 8(4): 4-6, 1992 (Eng).

Anticol, Amex and Calciprite, three composite herbal drugs, were administered orally concomitant with subcutaneous injection of sodium barbiturate to rats for three days. All the three drugs showed significant protective action against sodium barbiturate induced duodenal ulcer. Administration of the drugs to rats on 4th day after administration of sodium barbiturate for 3 days significantly cured the ulcers.

9301-0212 Pearce, B.C., Parker, R.A., Deason, M.E., Queshi, A.A., Wright, K.J.J. (Bristol-Mayers Squibb Pharmaceutical Research Institute, 5, Research Park Way Wallingford, Connecticut 06492, USA) **Hypocholesterolemic activity of synthetic and natural tocotrienols.** *Journal of Medicinal Chemistry*, v. 35(2): p. 3595-3606, 1992 (49 ref, Eng).

Richest sources of tocotrienols are cereals, viz., barley, viz., barley, oats, rice, wheat and rye and also from vegetable oils such as palm oil and rice bran oil. Tocotrienols are farnesylated benzopyran natural products that exhibit hypocholesterolemic activity in vitro and in vivo. The mechanism of their hypolipidemic action involves post-transcriptional suppression of HMG-CoA reductase by a process distinct from other known inhibitors of cholesterol biosynthesis. Gamma-tocotrienol exhibits a 30-fold greater activity toward cholesterol biosynthesis in-

cubation compared to alpha-tocotrienol in HePG2 cells in vitro. Also, isolation of tocotrienols from palm oil distillate using an improved procedure has been presented.

9301-0213 Pieri, F., Arnould-Guerin, M.L., Sefraoui, E.H. (Laboratoire de Pharmacologie, Faculte de Pharmacie 1, Rue des Louvels 80037 Amiens Cedex, France) **Cardiotonic glycosides from *Acokanthera spectabilis*.** *Fitoterapia*, v. 63(4): p. 333-336, 1992 (10 ref, Eng).

From the seeds of *A.spectabilis* acobioside A and 14-O-acovenidose C were isolated. Toxicity and cardiac activity of the latter cardioglycoside have been evaluated.

9301-0214 Pillai, N.R. (CDRS Pharmacological Unit, Medical College, Trivandrum, 695011, Kerala, India) **Anti-diarrhoeal activity of *Glycosmis cochinchinensis* root barks in experimental animals.** *Fitoterapia*, v. 63(4): p. 323-326, 1992 (7 ref, Eng).

G.cochinchinensis (syn. *G.pentaphylla*), used as an antidiarrhoeal herb in Indian folk medicine, was investigated for its effect on experimentally induced diarrhoea, in albino rats. Aqueous, petrol, chloroform and ethanol extract of root bark were evaluated to detect their effect on fecal output, castor oil diarrhoea and enteropooling by MgSO₄ (10 percent). All the extracts exhibited significant activity. However, the ethanol extract was found to be more effective at a lesser dose level. Acute toxicity tests revealed wide margin of safety.

9301-0215 Pongprayoon, U., Bohlin, L., Wasuwat, S. (Thailand Institute of Scientific and Technological Research, Bangkok, Bangkok, 10900, Thailand) **Neutralization of toxic effects of different crude jellyfish venoms by an extract of *Ipomoea pes-caprae* (L.) R.Br..** *Journal of Ethnopharmacology*, v. 35(1): p. 65-69, 1991 (13 ref, Eng).

An extract (IPA) of the plant *I.pes-caprae* was studied as to its ability to neutralize toxic activities of jellyfish venoms. Different venoms exhibited different degree of activity. When IPA was incubated with active venoms, it inhibited the actions of all jellyfish venoms tested, with IC₅₀ values in the range of 0.3-0.8 mg IPA/mg venom for proteolytic action, and with about 10 times lower IC₅₀ values for the neutralization of haemolytic action. These activities of IPA support the previously reported effectiveness in the treatment of dermatitis caused by jellyfish sting.

9301-0216 Rashan, L.J., Abd, A.A., Aziz, A.A. (Department of Biology, College of Education, University of Mosul, Mosul, Iraq) **Further observations on the pharmacological activities of the aqueous extract of *Aristolochia***

bottae stems. *Fitoterapia*, v. 63(4): p. 350-352, 1992 (5 ref, Eng).

The aqueous extract of *A.bottae* stems showed CNS depressant activity. The extract exhibited a marked analgesia together with the impairment of motor performance at doses ranging from 13 to 265 mg/kg i.p..

9301-0217 Reddy, C.R., Praveen Kumar, K., Rama Rao, M.(College of Veterinary Science, Rajendranagar, Hyderabad 500 030, AP, India) **Feed cost of milk production in crossbred cows fed neem cake.** *Cheiron*, v. 20(2&3): p. 43-46, 1991 (5 ref, Eng).

Four crossbred milch cows were fed concentrate mixtures in which 10,20 and 30 parts were replaced by water washed neem *Melia* sp. seed cake along with a basal roughage. Cost of milk production gradually decreased with incorporation of water washed neem seed cake in the concentrate mixture upto 30 percent level. Milk colour, taste, and acceptability were not effected. It was found that neem cake can be safely fed to milch cows upto 30 percent in concentrate mixture without any deleterious effects. NSL, New Delhi.

9301-0218 Sethi, O.P., Anand, K.K., Gulati, O.D.(2011 Haste St, No 6, Berkeley, CA94704, USA) **Evulation of Xanthotoxol for central nervous system activity.** *Journal of Ethnopharmacology*, v. 36(3): p. 239-247, 1992 (19 ref, Eng).

Xanthotoxol (XT), 8-hydroxypsoralen, exhibited dose-graded sedative activity in dogs, cats, rats, mice and hamsters. At doses of 5-20 mg/kg intraperitoneally (i.p) in cats and 3-100 mg/kg orally (p.o) in dogs, XT blocked predatory mouse/rat killing behavior. In mice, XT (10-300mg/kg i.p.) exhibited a dose-dependent reduction in locomotor activity but was less potent in this regard than reference diazepam (10-100 mg/kg i.p). Doses of 100-1000 mg/kg i.p. of XT in mice were used to study 48-h acute toxicity of XT and its LD50 was estimated to be 468 mg/kg. Doses of 10,40 and 80 mg./kg p.o. were used to study the chronic toxicity of XT in rats for 6 months and no side effects or abnormalities in reproductive activity or endocrine integrity were noted. The F1 generation of rats from 6-month XT-treated parents were free of teratogenic effects.

9301-0219 Seto, Y., Motoyoshi, S., Nakamura, H., Imuta, J.I., Ishitoku, T., Isayama, S.(Exploratory Research Laboratories and Developmental Research Laboratories, Dainippon, Pharmaceutical Company Limited, 33-94 Enoki, Suita, Osaka 564, Japan) **Effect of shikonin and its derivatives, pentaacetylated shikonin (MDS-004) on granuloma formation and delayed-type allergy in ex-**

perimental animals. *Yakugaku Zasshi*, v. 112(4): p. 259-271, 1992 (29 ref, Eng).

Of twelve reduced and acetylated derivatives of shikonin, a chemical constituent of Shikon (found in *Lithospermum erythrorhizon*), the accelerating activity on granuloma formation and the inhibitory activity on delayed-type allergy were investigated in order to find a compound having more characteristic effect than shikonin on wound healing in experimental animals. A reduced and pentaacetylated derivative of shikonin, MDS-004, showed more excellent pharmacological activity. MDS-004 (0.1-1mg/pellet) accelerated dose-dependently felt-pellet-induced granuloma formation when given topically together with felt-pellets in rats. It also produced strong inhibition against delayed-type allergies. Orally administered MDS-004, unlike shikonin, inhibited carrageenan-induced hind paw edema, and exhibited tendency to heal acetic acid-induced gastric ulcer in rats. MDS-004 did not produce irritative action on the ear skin at a topical dose of 1 mg/ear different from shikonin, and any behavioral changes after oral administration of 100 mg ka in mice.

9301-0220 Shimizu, K., Okano, Y., Inoue, S.(Division of Biocybernetics, Institute for Medical and Dental Engineering, Tokyo Medical and Dental University, Kanda-Surugadai 2-3-10, Chiyoda-ku, Tokyo 101, Japan) **Anti-fatigue effect of an enzyme-treated Panax ginseng extract on recovery sleep after forced locomotion in rats.** *Shoyakugaku Zasshi*, v. 46(3): p. 230-234, 1992 (12 ref, Jap, Eng).

Cyclomaltodextrin glucanotransferase-treated *P.ginseng* extract (CG-PGE), which has no bitter taste, was examined for its antifatigue effect on exercise-loaded sleep-deprived male rats. Forced locomotion by treadmill for 3 h prior to the dark period resulted in a significant increase in the slow wave sleep (SWS) at the expense of wakefulness (W) during the subsequent 12-h dark period. Oral administrations of 40 mg CG-PGE shortly before and after the exercise prevented the fatigue-derived enhancement of SWS and significantly recovered the amount of nocturnal W. However, latencies to the first episode of SWS and paradoxical sleep were scarcely affected. Similar but insignificant changes were observed after administrations of 20 mg CG-PGE. Thus, it was concluded that CG-PGE exerts an antifatigue activity in the presence of stress.

9301-0221 Singh, N., Tyagi, S.D., Agarwal, S.C.(Department of Zoology, Meerut College, Meerut 250 006, UP, India) **Antidiabetic effect of ethanolic extract of Syzygium cumini seed powder.** *Biosphere*, v. 3(1): p. 29-36, 1991 (15 ref, Eng).

Ethanol extract of *S.cumini* seed powder was able to lower the increased blood sugar of alloxan diabetic rats. The two significant features of the study were: 1) the blood sugar lowered once remained static, even after discontinuation of the extract for 15 days. 2) blood sugar never fell below normal values even with high dose of extract. NSL, New Delhi.

9301-0222 Susplugas, P., Mongold, J.J., Carnat, A.P., Camillieri, S., Masse, J.P., Taillade, C., Serrano, J.J. (Laboratoire de Matière Médicale, Faculté de Pharmacie, 15, av. Charles-Flahault-34060, Montpellier, France) **Diuretic activity of the lyophilized extract of roots of *Foeniculum vulgare* Gaertn. var. *Dulce* D.C..** *Plantes Médicinales et Phytothérapie*, v. 25(4): p. 163-169, 1991 (169 ref, Eng, Fre).

The diuretic properties of a lyophilized alcoholic extract (15 percent) of the roots of *F.vulgare* var. *dulce* has been investigated by experimental diuresis in rats. A toxicological study in rats did not reveal any sign of toxicity at the dose used.

9301-0223 Teel, R.W. (Department of Physiology and Pharmacology, School of Medicine, Loma Linda University, Loma Linda, CA 92350, USA) **Modulation of microsomal activity by potential chemopreventive agents of plant origin.** *Phytotherapy Research*, v. 6(5): p. 251-254, 1992 (43 ref, Eng).

Ten compounds with potential chemopreventive activity were studied to determine their effects on microsomal mixed-function oxidase and epoxide hydratase activity. Three of the ten compounds affected epoxide hydratase activity. Capsaicin inhibited; whereas, catechin and esculetin enhanced EH activity. Seven of the compounds tested inhibited microsomal mixed-function oxidase activity. In order of potency, these seven compounds were tannic acid, d-limonene, capsaicin, ellagic acid, propyl galate, esculetin and catechin. Since the mutagenic and/or carcinogenic action of many chemical is dependent upon the metabolic activity of microsomal mixed-function oxidase and epoxide hydratase, the modulation of this activity by these chemicals providing further evidence in support of their potential chemopreventive properties has been discussed.

9301-0224 Tisserand, R., Balacs, T. (P.O.Box 746, Hove, E.Sussex, BN 33XA, English) **May Chang.** *International Journal of Aromatherapy*, v. 4(3): p. 25-27, 1992 (10 ref, Eng).

One of world's big volume essential oils, may chang (*Litsea cubeba*) is unknown in the world of aromatherapy. Reports from China give an account of its uses. May chang components include geranial (40.6 percent), neral (33.8

percent), beside other minor constituents. In traditional Chinese medicine. May chang root and stem are used to treat dysmenorrhea, asthma and in the treatment of coronary heart diseases and high blood pressure. May chang gave protection in experimental animals to induced arrhythmia. The active component appears to be citral.

9301-0225 Wang, D.Z., Ma, G.E., Xu, R.S. (Shanghai Institute of Materia Medica, Academia Sinica, Shanghai 200 031, China) **Studies on the alkaloids of *Cephalotaxus* IX. Semi-synthesis of cephalotaxine esters and their antileukemic activity.** *Acta Pharmaceutica Sinica*, v. 27(3): p. 178-184, 1992 (11 ref, Chi, Eng).

Harringtonine, homoharringtonine, deoxyharringtonine and isoharringtonine isolated from *Cephalotaxus* plant are the esters of cephalotaxine with significant inhibitory activity against P-388 leukemia. In this investigation seventeen (1-17) new esters of cephalotaxine type alkaloids have been synthesized. Preliminary pharmacological examination showed that esters 1,2,2+3,6 and 8 showed similar antileukemic activity as homoharringtonine. Esters 4,5,15 and 16 showed moderate inhibitory activity. Some structure activity correlations of these esters were discussed.

9301-0226 Wang, L.X., Han, Z.W. (Department of Pharmacology, Inner Mongolia Medical College, Huhehaote 010059, Mongolia) **The effect of *Astragalus polysaccharide* on endotoxin induced toxicity in mice.** *Acta Pharmaceutica Sinica*, v. 27(1): p. 5-9, 1992 (15 ref, Chi, Eng).

The effect of *Astragalus polysaccharide* (APS) isolated from the radix of *A.membranaceus* var. *mongholicus* was investigated on *E.coli* endotoxin induced liver damage in mice. The effects of APS were shown to be dose dependent. The results revealed that APS has an antioxidative action. An ultramicroscopic examination showed that the injury of the biomembrane and the crest of mitochondria were ameliorated by APS pretreatment. These findings suggest that the protective effect of APS on *E.coli* endotoxin intoxicated mice may be due to its antioxidative action to protect the mitochondria biomembrane, therefore, the adenylate metabolism is improved in mice.

9301-0227 Wang, Y.H. (Xijing Hospital, Xi'an 710 032, China) **Clinical research on treatment of cervical spondylosis with Jing Tong Ning Granule.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(6): p. 343-345, 1991 (6 ref, Chi, Eng).

102 cervical spondylosis patients treated with Jing Tong Ning granule made of herbs according to the TCM principle has been reported. The animal experiments were

taken in order to test and verify the effects further. The results revealed that the total effective rate was 96.1 percent. The main hemorheological indexes (eg. blood viscosity and plasma viscosity) showed significant difference in statistics before and after treatment. The changes of eyeground microangium had significant difference too. The animal experimental results were the same as the clinical ones. It was concluded that Jing Tong Ning granule had the effects to decrease the blood viscosity, improve microcirculation and accelerate blood flow.

9301-0228 Xin-Li, H., Hattori, M.*, Namba, T. (Research Institute of Wakan-Yaku, Toyama, Medical and Pharmaceutical University, 2630, Sugitani, Toyama 93001, Japan) **Effect of a Carthami flos extract and its constituents on the beating amplitude of cultured myocardial cell sheets.** *Shoyakugaku Zasshi*, v. 46(3): p. 210-216, 1992 (19 ref, Eng, Jap).

By the bio-assay directed fractionation of the extract, 17 compounds were isolated from ether soluble and Bu-OH-soluble fractions of Carthami flos (*Carthamus tinctorius*) that increased the beat amplitude of cultured myocardial cell sheets prepared from mouse embryo hearts. Of the 17 compounds, scutellarein, 4-hydroxycinnamic acid, 3,4-dihydroxycinnamic acid, 6-hydroxykaempferol 3 glucoside and quercetin 3,7-diglucoside, appreciably increased the beating amplitude but apigenin decreased it. Since 6 hydroxykaempferol 3-glucoside inhibited (6H-36), Na-K⁺ ATPase activity, the positive inotropic effect of on cultured cells induced by 6h-3G may be correlated with its enzyme inhibition.

9301-0229 Xu, Y.M., Lu, P.C. (Nanjing College of TCM, Nanjing 210 029, China) **Experimental studies on immunostimulatory effects of the Isatis indigotica polysaccharide.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(6): p. 357-359, 1991 (9 ref, Chi, Eng).

Polysaccharides extracted from the root of *Isatis indigotica* (IIP, 50 mg/kg.d, ipX8d) significantly increased the weight of spleen and number of white blood cell and lymphocyte in peripheral blood in normal ICR mice, and antagonized the immunosuppressive actions of hydrocortisone. By administration of IIP, the percentage of ANAE⁺ lymphocytes stained with acid alpha-naphthyl acetate esterase method were significantly increased in peripheral blood of normal ICR mice, and the decreases in number of ANAE⁺ lymphocytes in mice induced by hydrocortisone were prevented to a certain extent. But IIP could not enhance Con. A-induced lymphocyte proliferation of C57BL mouse spleen cells in vitro assay. In addition, the plaque forming cells in 5 X 10⁵ splenocytes of NIH mice treated with IIP were higher than that of the control group (P). IIP could also

elevate the clearance rate of intra-venous charcoal particles in normal mice, i.e. stimulated the phagocytic activity of macrophages. The result indicates that IIP is capable of increasing humoral and cellular immune functions and enhancing the functions of reticuloendothelial system and might be a good immunopotentiator.

9301-0230 Yamamoto, M., Masui, T., Sugiyama, K., Yokota, M., Nakagomi, K., Nakazawa, H. (Sehizuoka Prefectural Institute of Public Health and Environmental Science, 4-27-2 Kita audo, Shizuoka 420, Japan) **Anti-inflammatory active constituents of Aloe arborescens Miller.** *Agricultural Biological Chemistry*, v. 55(6): p. 1627-1629, 1991 (6 ref, Eng).

Methanol extracts of *A. arborescens* yielded the aloenin, barbaloin, aloe-emodin, and beta-sitosterol. Methanol extracts showed significant inhibitory activity toward the carrageenan-induced edema in rats.

9301-0231 Zhou, Y., Saitto, H., Nishiyama, N. (Department of Chemical Pharmacology, Faculty of Pharmaceutical Sciences, University of Tokyo, Bunkyo-ku, Tokyo 113, Japan) **Effect of Acorus gramineus Soland on learning and memory performance in mice.** *Shoyakugaku Zasshi*, v. 46(2): p. 103-108, 1992 (13 ref, Eng).

A. gramineus extract ameliorated the memory retrieval deficit induced by ethanol, but not other memory impairment in mice. *Acorus* extract (250, 500 mg/kg p.o.) did not affect the passive avoidance responses of normal mice in the step through and step down tests, the conditioned and unconditioned avoidance responses of normal mice in the shuttle box and lever press performance tests, and the ambulatory activity of normal mice in normal condition. However, *Acorus* was shown to significantly decrease the spontaneous motor activity during the shuttle box test and also to prolong the sleeping time induced by pentobarbital in mice at 500 mg/kg. These results suggest that *Acorus* has an ameliorating effect on memory retrieval impairment and a weak tranquillizing.

9301-0232 Zhuang, X.X. (Shantou University Medical College, Shantou 515 031, China) **The protective effect of angelica injection on arrhythmia during myocardial ischemia reperfusion in rat.** *Chinese Journal of Integrated Traditional and Western Medicine*, v. 11(6): p. 360-361, 1991 (8 ref, Chi, Eng).

The protective effects of Angelica injection on the reperfusion arrhythmia were studied through the model of ischemic myocardial reperfusion in rats. The results showed that the incidence of ventricular premature beat and the total incidence of arrhythmia (IA) were greatly reduced by peritoneal injection of Angelica (0.6 gm crude drug/kg) in

rats. The difference between the Angelica group (n=12, IA=41.7 percent) and the saline control group (n=12, IA=91.7 percent) was significant. The data suggested that Angelica injection is effective on the protection of arrhythmia during the myocardial ischemia reperfusion in rats.

Antimicrobial Activity

9301-0233 Ahmed, S., Kapadia, Z., Kalhor, M.A., Badar, Y. (PCSIR Laboratories Complex, Karachi 75280, Pakistan) **Antifungal activity in *Salvia santolinifolia* Boiss.** *Pakistan Journal of Scientific and Industrial Research*, v. 35(4): p. 147-148, 1992 (19 ref, Eng).

Alcoholic extract of *S.santolinifolia* was tested against ten species of fungi. It showed selective fungistatic or antifungal action on some of the microbes.

9301-0234 Akunyili, D.N., Houghton, P.J.* , Raman, A. (Pharmacognosy Research Laboratories, Chelsea Department of Pharmacy, King's College London, Manresa Road, London SW3 6LX, UK) **Antimicrobial activities of the stem bark of *Kigelia pinnata*.** *Journal of Ethnopharmacology*, v. 35(2): p. 173-177, 1991 (10 ref, Eng).

Chemical investigation showed that the aqueous extracts of the stem bark of *K.pinnata* contain iridoids as major components. In the light of the traditional uses of this plant, antimicrobial activities of the aqueous extracts and two major iridoids were tested against *Bacillus subtilis*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida albicans*. The crude aqueous extracts showed significant antimicrobial activity which could be partially explained by the activity of the iridoids present.

9301-0235 Bashir, A., Hamburger, M., Gupta, M.P., Solis, P., Hostettmann, K. (Institut de Pharmacognosie et Phytochimie, Ecole de Pharmacie, Universite de Lausanne, BEP, CH-1015 Lusanne, Switzerland) **Biphenyls and a xanthone from *Monnina sylvatica*.** *Phytochemistry*, v. 31(9): p. 3203-3205, 1992 (18 ref, Eng).

Two novel biphenyls, 3'-hydroxy-4',5-dimethoxy-3,4-methylenedioxybiphenyl and 3',4',5-trimethoxy-3,4-methylenedioxybiphenyl, and a known xanthone were isolated from the roots of *M.sylvatica*. The structures of the isolated were established by spectroscopic methods. 3'-hydroxy-4'-5-dimethoxy-3,4'-5-dimethoxy-3,4-methylenedioxybiphenyl showed antifungal activity against *Cladosporium cucumerinum* in a bioautographic assay on LTC, and weak activity against *Candida albicans* and *Trichophyton mentagrophytes* in a dilution assay.

9301-0236 Bashir, A.K., El-Sayed, S., Hassan, M., Amiri, J., Abdalla, A.A., Wasfi, I.A. (Desert and Marine Environment Research Centre, United Arab Emirates University, Al Ain P.O.Box 17777, United Arab Emirates) **Antimicrobial activity of certain plants used in the folk-medicine of United Arab Emirates.** *Fitoterapia*, v. 63(4): p. 371-375, 1992 (3 ref, Eng).

Antimicrobial activity of 20 different plants belonging to 14 plant families have been investigated. All tested plant extracts exhibited some activity against Gram +ive bacteria. *Limonium stocksii* and *Inula crithmoides* were active against Gram negative bacteria (*E.coli* and *P.aeruginosa*). *Calligamum comosum*, *Rhazya stricta*, *Hamamada elegans*, *Joutertia auchei*, *Inula crithmoides*, *Zygophyllum hamianse*, *Z.gaterense* and *Cassia italica* exhibited activity against one of the tested fungi. The MIC of the methanol extract of *L.stocksii* against a number of microorganisms has also been estimated.

9301-0237 Bopegamage, S., Petrovicova, A. (Virology Department, Institute of Preventive and Clinical Medicine, Limbova 14, 83301 Bratislava, Czechoslovakia) **Effect of Arogyavardhini and Sanjeevani Gutti on Cocksackie viruses in vitro.** *Deerghayu International*, v. 8(4): p. 1-3, 1992 (4 ref, Eng).

Arogyavardhini and Sanjivani Gutti, two composite herbal drugs, exhibited antiviral activity against different types of coxsackie virus.

9301-0238 Deeni, Y.Y., Hussain, H.S.N. (Department of Biological Sciences, Bayero University, Kano, Nigeria) **Screening for antimicrobial activity and for alkaloids of *Nauclea latifolia*.** *Journal of Ethnopharmacology*, v. 35(1): p. 91-96, 1991 (25 ref, Eng).

Alcoholic extract of the root of *N.latifolia* was screened in vitro against thirteen micro organisms implicated in dental caries and gastroenteritis. The results indicate inhibitory action against all the test micro organisms. The antimicrobial activity is ascribed to the presence of alkaloids in the plant extracts.

9301-0239 Garg, S.C., Siddiqui, N. (Department of Chemistry, Doctor Hari Singh Gour Vishwavidyalaya, Sagar 470 003, MP, India) **In vitro antifungal activity of the essential oil of *Coriandrum sativum* Linn..** *Journal of Research and Education in Indian Medicine*, v. 11(3): p. 11-13, 1992 (4 ref, Eng).

The essential oil derived from the seeds of *C.sativum* has been studied in vitro for its antifungal activity against 18 fungal organisms using 'filter paper disc agar diffusion technique'. The oil has shown moderate to excellent activity against the test fungi. The strong antifungal activity against

Alternaria alternata, *Curvularia lunata*, *Pestalotia psidi*, *Phytophthora parasitica*, *Trichoderma viride* and *Colletotrichum capsici* can be exploited after detailed in vivo studies. The use of essential oils as fungicides may reduce the pollution as these are biodegradable.

9301-0240 Ghazal, S.A., Abuzarqa, M., Mahasneh, A.M. (Department of Biological Sciences and Department of Chemistry, Faculty of Science, University of Jordan, Amman, Jordan) **Antimicrobial activity of *Polygonum equisetiforme* extracts and flavonoids.** *Phytotherapy Research*, v. 6(5): p. 265-269, 1992 (21 ref, Eng).

Methanol, hexane, aqueous and petroleum ether extracts of the whole plant *P. equisetiforme* did not show any activity against ten bacterial and four fungal species. The butanol crude extract and all the pooled groups of this exhibited variable patterns of antimicrobial activity. Quercetin (a flavonol) has been isolated and identified as the major constituent. The antifungal activity of quercetin was limited to *Candida tropicalis* and had a narrow antibacterial spectrum of activity. However, its activities against *Enterobacter aerogenes* and *Escherichia coli* were low grade compared with ampicillin, streptomycin and gentamycin. Quercetin-3-O-rhamnoside, quercetin-3-O-glucuronide, quercetin-3-O-arabinoside and isorhamnetin were also isolated in very low yield. They have not been reported previously in this species.

9301-0241 Gnanaguru, M., Raman, N., Gopinathan, S., Rajendran, V. (Centre for Advanced Studies in Botany, University of Madras, Guindy Campus, Madras 600 025, TN, India) **Antimicrobial activity of *Funaria hygrometrica* Hedw.** *Indian Drugs*, v. 29(13): p. 598-600, 1992 (13 ref, Eng).

Aqueous ethyl acetate and methanol extracts of *Funaria hygrometrica* were tested against *Escherichia coli*, *Haemophilus influenza*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Salmonella typhi*, *Shigella boydii*, *Xanthomonas oryzae* pv. *oryzae*, *X. campestris* pv. *citri*, *Rhizoctonia solani* and *Fusarium oxysporum* sp. *lycopersici*. Positive antimicrobial activities were observed with ethyl acetate extract against all bacteria and *Fusarium oxysporum* sp. *lycopersici*. Methanol extract also inhibited the bacterial isolates except *P. mirabilis* and *S. boydii*. No inhibitory activity by aqueous extract was noticed. Partially purified compound was found to be phenolic in nature.

9301-0242 Graven, E.H., Deans, S.G., Svoboda, K.P., Mavi, S., Gundidza, M.G. (ARDRI, University of Fort Hare, Alice, South Africa) **Antimicrobial and antioxidative properties of the volatile (essential) oil of *Artemisia afra* Jacq.** *Flavour and Fragrance Journal*, v. 7(3): p. 121-123, 1992 (15 ref, Eng).

The main components of volatile oil of *A. afra* were alpha- and beta-thujone (52 percent), 1,8-cineole (13 percent), camphor (15 percent) and alpha-pinene (20 percent). Fifteen test bacteria and one fungus showed high degree of inhibition of growth caused by the volatile oil. The oil exerted considerable antioxidant effect.

9301-0243 Jain, S.C., Purohit, M., Jain, R. (Medicinal Plants Research Laboratory, Department of Botany, University of Rajasthan, Jaipur-302004, Rajasthan, India) **Pharmacological evaluation of *cuminum cyminum*.** *Fitoterapia*, v. 63(4): p. 291-294, 1992 (13 ref, Eng).

C. cyminum seed and / or callus extracts and essential oils were investigated for antibacterial, antifungal antiviral and antitumor activities. The extracts inhibited bacteria and fungi as well as poliomyelitis and Coxsackie viruses. No significant antitumor activity was observed. Orally administered seed powder lowered the blood glucose levels in hypoglycemic rabbits.

9301-0244 Kartnig, T., Still, F., Reinthaler, F. (Institute of Pharmacognosy and Hygiene Institute, University of Graz, Austria) **Antimicrobial activity of the essential oil of young pine shoots (*Picea abies* L.).** *Journal of Ethnopharmacology*, v. 35(2): p. 155-157, 1991 (3 ref, Eng).

The antimicrobial activity of the essential oil of young *P. abies* was investigated and compared with that of a commercial pine needle oil and chloramphenicol. The correlation between the antimicrobial activity of the essential oils and their compositions, analysed by gas chromatography, is discussed.

9301-0245 Kubo, I., Muroi, H., Himejima, M. (Division of Entomology and Parasitology, College of Natural Resources, University of California, Berkeley, California 94720, USA) **Antibacterial activity of totarol and its potentiation.** *Journal of Natural Products*, v. 55(10): p. 1436-1440, 1992 (15 ref, Eng).

Antimicrobial activity of six diterpenoids isolated from the bark of *Podocarpus nagi* has been tested against twelve selected microorganisms. Totarol, the most abundant compound among the six, exhibited potent bactericidal activity only against Gram-positive bacteria. The bactericidal activity of totarol was enhanced when it was tested in combination with several other natural products. The synergistic activity of anacardic acid caused the minimum bactericidal concentration (MBC) of totarol to be lowered from 1.56 to 0.2 micro/ml.

9301-0246 Kusamba, C., Byamana, K., Mbuyi, W.M. (Department de Biologie, Centre de Recherche en Sciences, Naturelles, Lwiro, D.S. Bukava, Kivu, Zaire) **An-**

antibacterial activity of *Mirabilis jalapa* seed powder. *Journal of Ethnopharmacology*, v. 35(2): p. 197-199, 1991 (6 ref, Eng).

The antibacterial activity of seed powder extracts of *M.jalapa* were screened against source Gram-positive and Gram-negative bacteria, isolated from infected wounds and diarrhoeal faecal matter. The results indicate that aqueous, methanol and totum extracts of the seed powder exhibit inhibition of the bacteria barring Enterobacteria species by the aqueous extract.

9301-0247 Kusumoto, I.T., Kakiuchi, N., Hattori, M., Namba, T., Sutaradjo, S., Shimotohno, K. (Research Institute for Wakan-Yaku, Toyama Medical and Pharmaceutical University, 2630, Sugitani Toyama 93001, Japan) **Screening of some Indonesian medicinal plants for inhibitory effects on HIV-1 protease.** *Shoyakugaku Zasshi*, v. 46(2): p. 190-193, 1992 (14 ref, Eng).

Methanol and water extract of 30 Indonesian plants were investigated for their inhibitory activity on HIV-1 protease (PR). The PR inhibitory activity was determined by incubating the extracts in 9 reaction mixtures containing PR and substrate at pH. 5.0 to perform proteolytic cleavage reaction. The cleavage product was measured by reverse-phase HPLC of the extracts tested, the methanol extract of *Swietenia mahagoni* bark and *Terminalia belerica* fruit peel and both methanol and water extracts of *Woodfordia floribunda* flower and leaves showed strong PR inhibitory activity.

9301-0248 Kusumoto, I.T., Shimada, I., Kakiuchi, N., Hattori, M., Namba, T., Supriyatna, S. (Research Institute for Wakan-Yaku (Traditional Sino-Japanese Medicines), Toyama Medical and Pharmaceutical University, 2630 Sugitani, Toyama, 930-01, Japan) **Inhibitory effects of Indonesian plant extracts on reverse transcriptase of an RNA tumour virus (I).** *Phytotherapy Research*, v. 6(5): p. 241-244, 1992 (14 ref, Eng).

Methanol and water extracts of 30 Indonesian medicinal plants were tested for inhibitory activity on avian myeloblastosis virus (AMV)- reverse transcriptase (RT). The most potent inhibition was shown by extracts of *Loranthus parasiticus* (whole plant), *Helicteres isora* (fruit), *Terminalia belerica* (fruit peel), *Strobilanthes crispus* and *Woodfordia floribunda* (flower and leaves). Two kinds of template-primers, were examined for polymerization reaction. These extracts showed no appreciable cytotoxicity at concentrations where over 90 percent of RT activity was inhibited.

9301-0249 Lopez-Garcia, R.E., Hernandez-Perez, M., Rabanal, R.M., Darias, V., Martin-Herrera, D., Arias, A.,

Sanz, J. (Departamento de Farmacologia, Facultad de Farmacia, Universidad de La Laguna, Madrid, Spain) **Essential oils and antimicrobial activity of two varieties of *Cedronella canariensis* (L.) W. et B.** *Journal of Ethnopharmacology*, v. 36(3): p. 207-211, 1992 (9 ref, Eng).

The qualitative and quantitative determination of the essential oils of the aerial part of two varieties of *C.canariensis* namely *C.canariensis* var. *canariensis* and *C.canariensis* var. *anisata* have been performed, together with the study of the antimicrobial activity of both oils. The noteworthy inhibition exhibited against *Bordetella bronchiseptica* and *Cryptococcus albidus* may justify the popular use of these plants in the treatment of certain diseases of the respiratory tract.

9301-0250 Muhammad, I., Mossa, J.S., El-Ferally, F.S. (Research Center for Medicinal, Aromatic and Poisonous Plants and Department of Pharmacognosy, College of Pharmacy, King Saud University, P.O.Box 2457, Riyadh 11451, Kingdom of Saudi Arabia) **Antibacterial diterpenes from the leaves and seeds of *Juniperus excelsa* M.Bieb.** *Phytotherapy Research*, v. 6(5): p. 261-264, 1992 (29 ref, Eng).

Two diterpenes from *J.excelsa*, were found to possess significant antibacterial activity in a two-fold serial dilution assay. (+)-Feruginol (abieta-8,11,13-triene-12-ol) and (-)-sandaracopimeric acid (isopimara-8(14),15-diene-18-oic acid) exhibited significant activity against *Bacillus subtilis*, *Staphylococcus aureus* and *Streptococcus durans*, while their corresponding 3beta-hydroxy derivatives {(hinokiol and 3beta-hydroxysandaracopimeric acid, also isolated from *J.excelsa* were found to be inactive. (+)-Ferruginol, in addition, demonstrated strong activity against *Mycobacterium smegmatis*, *M.intracellulare*, *M.xenopi* and *M.chelonii*.

9301-0251 Prasad, Y.R., Baby, P., Alankararao, G.S.J.G.* (Division of Organic Chemistry, Government (P.G) College (Andhra University) Rajahmundry, AP, India) **Leaf oil of *Piper betle* Linn: The in vitro antimicrobial studies.** *Parfumerie und Kosmetik*, v. 73(8): p.544, 1992 (7 ref, Eng).

The volatile leaf oil exhibited very high inhibition of growth of *E.coli*, *A.s.B*, *B.proteus* and *S.pneumonia* compared to the standard bactericide penicillin and it did not vary with the dilution. In the case of *S.aureus* and *B.anthrox* the inhibitory activity is relatively decreased with the dilution. The oil showed highest antifungal activity against *Rhizopus cans* and *A.niger* even at much lower concentrations (1:250 and 1:500). The fungicidal activity is comparable to that of resorcinol. *A.flavus* and *C.albicans* are resistant to the oil at low concentrations.

9301-0252 Sharma, R.K., Behari, M. (SV College Aligarh, Aligarh 202001, UP, India) **Screening of the compounds isolated from *Amaranthus tricolor* for antibacterial activity.** *Acta Ciencia Indica*, v. 17C(4): p. 357-362, 1991 (8 ref, Eng).

Petroleum ether extracts of *A. tricolor* has afforded n-alkanes, n-alkanols, and sterols. Based on their zone of inhibition against the micro-organisms among the isolated compounds, sterols exhibited stronger antibacterial activity compared to the moderate response by n-alkanes and cumulatively a greater potential for medicinal value of the aerial parts. NSL, New Delhi.

9301-0253 Srivastava, C., Siddiqui, I.R., Tiwari, H.P. (Department of Chemistry, University of Allahabad, Allahabad 211002, UP, India) **An antifeedant and insecticidal steroid and a new hydroxyketone from *Cassia siamea* bark.** *Journal of Indian Chemical Society*, v. 62(2): p. 111, 1992 (4 ref, Eng).

Air dried powdered plant on extraction with ethanol afforded 11-hydroxyhexacosan-2-one and 6 α , 7 α , 22, 24, 25 triepoxy-5, 26-dihydroxy-17 (13-18)-abeo-5 α -ergosta-2, 13, 15, 17, tetraen-1-one. This compound has been reported to possess antifeedant and insecticidal property.

9301-0254 Wahyuono, S., Hoffmann, J.J., McLaughlin, S.P. (Fakultas Farmasi, Universitas Gadjah Mada, Yogyakarta, Indonesia) **Dehydrofaltarindiol, potential antimicrobial agent from *Artemisia pacifica*.** *Fitoterapia*, v. 63(4): p. 368, 1992 (5 ref,

Isolation of dehydrofaltarindiol {heptadeca-1, 9(z), 16-trien-4, 6-diyn-3, 8-diol} from the aerial parts of *A. pacifica* is reported. Dehydrofaltarindiol inhibited the in vitro growth and in vitro growth of *Bacillus subtilis* at 25 micro g/ml, *Staphylococcus aureus* at 50 micro g/ml, *Klebsiella pneumoniae* at 100 micro g/ml and *Candida albicans* at 25 micro g/ml when tested by the agar diffusion method.

9301-0255 Yahara, S., Nakazono, M., Tutumi, H., Nohara, T. (Faculty of Pharmaceutical Sciences, Kumamoto University Oe-honmochi 5-1, Kumamoto 862, Japan) **Lignans from leaves of *Laurus nobilis* L.** *Shoyakugaku Zasshi*, v. 46(2): p. 184-186, 1992 (6 ref, Eng).

Three lignans glycosides, (+)-secoisolariciresinol 9-O-beta-D-xylopyranoside, (+)-5-methoxyisolariciresinol 9-O-beta-D-xylopyranoside and schizandraside, along with Z-3-hexenyl-O-beta-D-glucopyranoside were isolated from the leaves of *L. nobilis*.

9301-0256 Young, M.C.M., Braga, M.R., Dietrich, S.M.C., Gottlieb, H.E., Trevisan, L.M.V., Bolzani, V.D.S. (Instituto

de Quimica, Universidade Estadual Paulista, CP 355, 14800, Araraquara, Sao Paulo, Brazil) **Fungitoxic non-glycosidic iridoids from *Alibertia macrophylla*.** *Phytochemistry*, v. 31(10): p. 3433-3435, 1992 (7 ref, Eng).

The aqueous alcohol extract of the leaves of *A. macrophylla* afforded two epimeric pairs of iridoid aglycones and one of them showed high inhibitory activity against *Aspergillus niger*, *Cladosporium sphaerospermum*, *C. cladosporioides* and *Colletotrichum gloesporioides*. Three of the compounds are reported for the first time from natural sources. Their structures were established on the basis of spectroscopic studies, mainly through ¹³C NMR analysis.

Insecticidal & Piscicidal Activity

9301-0257 Bhagawan, C.N., Reddy, K.D., Sukumar, K. (Entomology Unit, Indian Institute of Chemical Technology, Hyderabad 500 007, AP, India) ***Annona*-induced growth anomalies and protein depletion in red cotton bug *Dysdercus koenigii*.** *Indian Journal of Experimental Biology*, v. 30(10): p. 908-912, 1992 (21 ref, Eng).

Petroleum ether, methanol extract of *A. squamosa* seeds when topically applied to fresh 5th instar nymphs of *D. koenigii* initiated dose dependent changes resulting in delayed metamorphosis with abnormal wing developments, deep melanization and finally death correlated significantly to toxicity, the whole body protein showed substantial depletion with disappearance of certain protein bands.

9301-0258 Bhatt, J.P. (Department of Zoology, H N Bahugana Garhwal University, Srinagar 246174, UP, India) **Neurodepressive action of a piscicidal glycoside of plant, *Aesculus indica* (Colebr.) in fish.** *Indian Journal of Experimental Biology*, v. 30(5): p. 437-439, 1992 (18 ref, Eng).

Sublethal concentration (2.6 mg/l) of a triterpene based piscicidal glycoside of *A. indica* damaged the neurons, fibre tracts and central correlation sites for gustatory, tactile and visceral sensory impulses in medulla oblongata of fish after prolonged poisoning. The fear, sinking to bottom, lack of schooling and non discriminatory pattern in treated fish were because of neurodepression. The jerky movement, ventilatory inefficiency, swallowing air bubbles and light pinkness of gills were due to the degradation of respiratory centres in the vagal lobes of toxified fish.

9301-0259 Chintalwar, G.J., Ramakrishnan, V., Luthria, D.L., Banerji, A.* (Bio-Organic Division, Bhabha Atomic Research Centre, Trombay, Bombay 400 085, Maharashtra, India) **Insect antifeedants from the roots of *Psoralea corylifolia* Linn.** *Indian Journal of Experimental Biology*, v. 30(9): p. 858-859, 1992 (10 ref, Eng).

Petrol extracts of roots of *P.corylifolia* caused feeding inhibition to the 4th instar *Spodoptera litura* f larvae. Furanocourmarins, psoralen and isopsoralen were characterised as the active principles.

9301-0260 Chockalingam, S., Manoharan, T., Shankar Kumar, U. (Zoological Research Laboratory, Thiagarajan College, Madura 625009, TN, India) **Ovicidal, larvicidal and pupicidal activities of an indigenous plant extract against *Pericallia ricini* (Arctidae:Lepidoptera).** *Journal of Environmental Biology*, v. 13(3): p. 197-199, 1992 (7 ref, Eng).

Flower extracts of *Delonix regia* was evaluated and the results showed that the percentage of hatching of eggs was significantly reduced by the plant extract treatment. It is also highly toxic to larvae and pupae. Third instar larvae are more susceptible to extract than final instar larvae. The adult emergence from the treated pupae was completely inhibited at a concentration of 200 ppm. NSL, New Delhi.

9301-0261 French, C.J., Towers, G.H.N. (Agriculture Canada, Vancouver Research Station, 6660 N.W. Marine Drive, Vancouver, B.C. Canada V6T 1X2) **Inhibition of infectivity of potato virus X by flavonoids.** *Phytochemistry*, v. 31(9): p. 3017-3020, 1992 (15 ref, Eng).

Infectivity of potato virus X (PVX) in *Chenopodium quinoa* was strongly inhibited (80 percent) by low concentrations (micro g/ml) of quercetin. Morin and 3-O-methylgalangin were also strong inhibitors. Methoxylation of quercetin reduced the inhibitory effect. Quercetin did not induce resistance, did not affect symptom development, had no direct viricidal effect and did not affect multiplication of PVX in infected leaf discs. Quercetin did not reduce infectivity when applied either before or after PVX inoculation. When PVX-RNA was used as inoculum, quercetin stimulated infectivity by 75 percent. It is proposed that quercetin interferes with an interaction between PVX coat protein and a host receptor essential for infection.

9301-0262 Hanawa, F., Tahara, S., Mizutani, J. (Mizutani Plant Echochemicals Project- JRDC, Eniwa RBP, Megumino Kita-3-1-1, Eniwa-shi 061-13, Japan) **Antifungal stress compounds from *Veratrum grandiflorum* leave treated with cupric chloride.** *Phytochemistry*, v. 31(9): p. 3005-3007, 1992 (8 ref, Eng).

Two antifungal stilbenoids and their glucosides were isolated from the leaves of *V.grandiflorum* treated with cupric chloride. They were identified as resveratrol, oxyresveratrol, resveratrol-3-O-glucoside (piceid) and oxyresveratrol-3-O-glucoside. The last compound was isolated for the first time from a natural source. In addition three glucosides of flavonoid (apigenin-7-O-glucoside,

luteolin-7-O-glucoside, chrysoeriol-7-O-glucoside) were also found in the leaves.

9301-0263 Kubo, I., Murai, Y., Chaudhuri, S.K. (Division of Entomology and Prasitology, College of Natural Resources, University of California, Berkeley, CA 94720, USA) **Structure of chaparramarin, a quassinoid from *Castela tortuosa*.** *Phytochemistry*, v. 31(9): p. 3262-3264, 1992 (8 ref, Eng).

A new quassinoid, chaparramarin has been isolated and identified as an insect growth inhibitor against the lepidopteran pest insect, *Heliothis virescens* (tobacco budworm), from the bark of *C.tortuosa* (known as chaparro amargo in Mexico).

9301-0264 Rai, M.K., Rajak, R.C., Rajak, R.K. (Department of Botany, Danielson College, Chhindwara 480001, MP, India) **In vitro effect of eleven medicinal plants on the morphology and cultural characters of *Phoma medicaginis* var. *pinodella*, a casual organism of *Phaseolus radiatus* Linn..** *Journal of Plant Anatomy and Morphology*, v. 5(2): p. 66-67, 1991 (8 ref, Eng).

In vitro efficacy of 11 medicinal plants viz., *Calotropis procera*, *Catharanthus roseus*, *Carica papaya*, *Citrus medica*, *Clerodendron inermis*, *Eucalyptus lanceolatus*, *Ipomoea cornea*, *Lantana camara*, *Lawsonia alba*, *Ocimum sanctum* and *Azadirachta indica* was evaluated against *P.medicaginis* var. *pinodella*. The maximum percentage of inhibition of the growth was exhibited by *A.indica* and *C.roseus*. The minimum inhibition was shown by extracts of *L.camara*.

9301-0265 Saxena, A., Saxena, R.C. (PG Department of Zoology, SSL Jain College Vidhisha, MP, India) **Effects of *Ageratum conyzoides* extract on the developmental stages of malaria vector, *Anopheles stephensi* (Diptera:Culiadae).** *Journal of Environmental Biology*, v. 13(3): p. 207-209, 1992 (5 ref, Eng).

Methanol extract of *A.conyzoides* was used to observe the developmental defects of preimaginal stages of *A.stephensi*. The crude extract was found to suppress the populations of the vector at higher dosages, while lower dosages were found to induce several developmental defects and ultimately decreasing the growth index to a considerable extent. NSL, New Delhi.

9301-0266 Shah, S.M.D. (PG Department of Zoology, Khadir Mohideen College, Adirampattinam 614701, TN, India) **Effect of plant extracts on the mortality of *Gryllobates sigillatus* (Orthoptera:Gryllidae).** *Journal of Ecotoxicology and Environmental Monitoring*, v. 2(1): p. 27-30, 1992 (14 ref, Eng).

The effect of total leaf alkaloids and total root alkaloids extracts of *Catharanthus roseus* on the female nymphal instars of *Gryllobates sigillatus* was studied. Topical application of these extracts in varied concentration to newly moulted VI, VII and VIII female nymphs produced 11 to 100 percent mortality. Total root alkaloids showed higher percentage deaths than total leaf alkaloids. The results indicated a linear relationship between percentage mortality and the dose applied. NSL, New Delhi.

9301-0267 Varanda, E.M., Zuniga, G.E., Salatino, A., Roque, N.F., Corcuera, L.J. (Departamento Biologia, FFCL-RB Universidade de Sao Paulo, Avenida Bandeirantes 3900, 14049 Ribeirao Preto, SP, Brazil) **Effect of ursolic acid from epicuticular waxes of *Jacaranda decurrens* on *Schizaphis graminum*.** *Journal of Natural Products*, v. 55(6): p. 800-803, 1992 (10 ref, Eng).

Ursolic acid from *J. decurrens* showed toxicity and feeding deterrence towards the greenbug *S. graminum*. Biological activity was determined by analyzing ursolic acid effects on the survival, reproductive index, and population growth rate of the greenbug. Survival and reproductive index decreased in direct proportion to ursolic acid content in the diet. The population growth rate decreased markedly when the aphids were fed on barley leaves sprayed with ursolic acid dissolved in DMSO, in comparison to leaves sprayed only with DMSO. The feeding behaviour of the greenbug was also affected by ursolic acid. Ingestion time on diet with 0.1 mM was reduced about 30 percent in relation to the ingestion time on control diet.

Phytochemistry

9301-0268 Abdel-Halim, O.B., Sekine, T., Saito, K., Saito, K., Halim, A.F., Abdel-Fattah, H., Murakoshi, I.* (Faculty of Pharmaceutical Sciences, Chiba University, 1-33 Yayoi-cho, Inage-ku, Chiba 263, Japan) **(+)-12alpha-Hydroxylupanine, a lupin alkaloid from *Lygos raetam*.** *Phytochemistry*, v. 31(9): p. 3251-3253, 1992 (21 ref, Eng).

A new lupin alkaloid, (+)-12alpha-hydroxylupanine, was isolated from the aerial parts of *L. raetam*, together with six known alkaloids; (+)-retamine, (+)-sparteine, (-)-lupanine, (-)-anagyrine, (-)-cytisine and (-)-N-methylcytisine. The structure of the new alkaloid including absolute configuration was determined by spectroscopic methods and by its chemical transformation to (+)-retamine.

9301-0269 Abdel-Mogib, M., Ayyad, S.N.* , Metwally, M.A., Dawidar, A.M. (Department of Chemistry, Faculty of Science, University of Mansoura, Mansoura, Egypt) **Lac-**

tones from *Pituranthos tortuosus*. *Pakistan Journal of Scientific and Industrial Research*, v. 35(3): p. 93, 1992 (6 ref, Eng).

Air-dried aerial parts were extracted with petroleum ether-ether-methanol (1:1:1) and chromatographed. The components obtained were identified as beta bisabolene, myristicin, ligusticum lactone, ligustilide and phenylpropanoid myristicum.

9301-0270 Abe, F., Yanaycgu, T., Wan, A.S.C. (Faculty of Pharmaceutical Sciences, Fukuoka University, 8-19-1, Nanakuma, Jonan-ku, Fukuoka 814-01, Japan) **Cardiac glycosides from the leaves of *Thevetia neriifolia*.** *Phytochemistry*, v. 31(9): p. 3189-3193, 1992 (9 ref, Eng).

Following the investigation of the constituents from the leaves of *T. neriifolia* the leaves of the species were examined, along with other common glycosides. alpha-L-Rhamnosides of digitoxigenin, cannogenin and thevetiogenin, and glycosides of uzarigenin were isolated from the leaves. Two 18,20-epoxy-derivatives of digitoxigenin alpha-L-thevetoside were isolated and C-20 configurations are discussed.

9301-0271 Abou-Karam, M., Shier, W.T.* (Department of Medicinal Chemistry, College of Pharmacy, University of Minnesota, Minneapolis, Minnesota 55455, USA) **Isolation and characterization of an antiviral flavonoid from *Waldsteinia fragarioides*.** *Journal of Natural Products*, v. 55(10): p. 1525-1527, 1992 (14 ref, Eng).

The antiviral agent in a fraction from *W. fragarioides* (Rosaceae) was purified using bioassay-guided fractionation of activity against herpes simplex type 1 virus. Structural elucidation by instrumental methods identified the active component to be the known flavonoid glycoside, isoquercitrin (3,3',4',5,7-pentahydroxyflavone-3beta-O-glucoside), which had not previously been shown to possess antiviral activity.

9301-0272 Adhikari, R., Bashyal, B.P., Shrestha, K., Singh, V. (Central Research Laboratory, Royal Nepal Academy of Science and Technology, P O Box 3323, Kathmandu, Nepal) **Chemical investigation of the essential oil of *Eupatorium adenophorum* (Compositae).** *Journal of Nepal Chemical Society*, v. 10: p. 30-32, 1991 (8 ref, Eng).

Isolation of cadinene and its derivatives from the essential oil of *E. adenophorum* (Banmara) is reported.

9301-0273 Adhikary, S.R., Shakya, R.* (Royal Drug Research Laboratory, Thapathali, Kathmandu, Nepal) ***Eucalyptus camaldulensis* leaf oil: a new source of medicinal eucalyptus oil.** *Journal of Nepal Chemical Society*, v. 10: p. 14-19, 1991 (Eng).

The leaves of *E.camaldulensis* were evaluated for their possible utilisation as a source of eucalyptus oil. The fresh leaf was found to contain essential oil. GC and GC/MS analysis of the oil showed the presence of 12 components of which cineole was a major constituent (60-65 percent). The other constituents identified include alpha-pinene, beta-pinene, limonene, caryophyllene and 1(7)-p-menthen-9-ol. The oil was rectified (75 percent) which conformed to the standards set for the medicinal eucalyptus oil (cineole content above 70 percent). The rectified oil can be substituted for the imported eucalyptus oil which is normally obtained from other well known essential oil yielding species of *Eucalyptus* (e.g. *E. globulus*).

9301-0274 Ahmad, V.U., Ismail, N., Arif, S., Amber, A.R. (H E J Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **Two new N-acetylated spermidine alkaloids from *Capparis decidua*.** *Journal of Natural Products*, v. 55(10): p. 1509-1512, 1992 (6 ref, Eng).

Two new spermidine alkaloids, 14-N-acetylisocodonocarpine and 15-N-acetylcapparisine, have been isolated from the root bark of *C. decidua*, and their structures have been determined based on the spectral and chemical data.

9301-0275 Ahmad, V.U., Farooqui, T.A., Fizza, F.K., Sultana, A., Khatoon, R. (H E J Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **Three new eudesmane sesquiterpenes from *Pluchea arguta*.** *Journal of Natural Products*, v. 55(6): p. 730-735, 1992 (17 ref, Eng).

Three new eudesmane sesquiterpenes, 3'-chloro-2'-hydroxyarguticin, deacetoxy-3'-chloro-2'-hydroxyarguticin, and 4,5-epi-cryptomeridiol, were isolated from the whole plant of *P. arguta*. The structures were elucidated on the basis of spectroscopic studies.

9301-0276 Ahmad, V.U., Iqbal, S. (H.E.J. Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **Cohrisitine, a new isoquinoline alkaloid from *Cocculus hirsutus*.** *Fitoterapia*, v. 63(4): p. 308-310, 1992 (17 ref, Eng).

A new isoquinoline alkaloid cohrisitine was isolated from the aerial parts of *C. hirsutus*. The structure of the new compound was determined by spectroscopic methods.

9301-0277 Ahmed, A.A. (Department of Chemistry, Faculty of Science, El-Minia University, El-Minia, Egypt) **Farnesol and thymol derivatives from *Asteriscus pygmaeus*.** *Journal of Natural Products*, v. 55(6): p. 824-827, 1992 (8 ref, Eng).

Investigation of the aerial parts of *A. pygmaeus* has yielded a new thymol derivative and four new farnesol glucosides. The structures of the new compounds were identified by ¹H NMR, ¹H-¹³C correlation, and HRMS.

9301-0278 Al-Hazimi, H.M.G., Basha, R.M., Al-Zoman, M.M. (Department of Chemistry, College of Science, King Saud University, Riyadh 11451, Saudi Arabia) **A p-coumaric acid ester and flavonoids from *Artemisia monosperma*.** *Oriental Journal of Chemistry*, v. 8(3): p. 203-207, 1992 (13 ref, Eng).

Eight flavonoids and a new p-coumaric acid ester have been isolated from the chloroform extract of the aerial parts of *A. monosperma*. The structures were elucidated by spectral methods. Four flavonoids were isolated for the first time from this species.

9301-0279 Ali, M. (Faculty of Pharmacy, Jamia Hamdard, Hamdard Nagar, New Delhi 110 062, India) **Chemical examination of fruits of *Terminalia balerka* Roxb.** *Oriental Journal of Chemistry*, v. 8(3): p. 255-256, 1992 (6 ref, Eng).

Two new aliphatic constituents viz., ditriacontan-2-ol, and tritriacontan-9-one along with known compounds alpha-tritriacontane and tetratriacontane were isolated from fruits of *T. balerica*. The structures of these compounds have been established by spectroscopic means.

9301-0280 Alice, C.B., Vargas, V.M.F., Silva, G.A.A.B., de Siqueira, N.C.S., Schapoval, E.E.S., Gleye, J.*, Henriques, J.A.P., Henriques, A.T. (Faculte des Sciences Pharmaceutiques, Universite Toulouse III, 31 Allées Jules Guesde, F 31047, Toulouse, France) **Screening of plants used in south Brazilian folk medicine.** *Journal of Ethnopharmacology*, v. 35(2): p. 165-171, 1991 (19 ref, Eng).

Thirty-seven species of medicinal plants used in folk phytotherapy were chemically screened for alkaloids, coumarins, flavonoids, anthraquinones, saponins, sterols and/or triterpenes and tannins. Seven of these were also screened for the presence of mutagenic activity using the Ames test (Salmonella/microsome).

9301-0281 Alvarez, L., Velasco, A., Villarreal, M.L., Delgado, G., Chavez, M.I., Rio, F.D. (Departamento de Quimica Organica de la Facultad de Ciencias Quimicas e Industriales, Universidad Autonoma del Estado de Morelos, Avenida Universidad 1001, Cuernavaca, Morelos, Mexico) **Constituents of a population of *Ambrosia hispida* and cytotoxic evaluation of its major constituent, hispidulin.** *Fitoterapia*, v. 63(4): p. 366-367, 1992 (5 ref, Eng).

From the aerial parts of *A.hispida*, damsinic acid, stigmasterol, ent-kaur-16-en-19-oic acid, ambrosin, damsin, hispidulin and pedalitin have been isolated. The cytotoxic activity of hispidulin was evaluated against KB tumour cell line derived from a human epidermoid nasopharyngeal carcinoma, and against P388 lymphocytic leukemia in mouse, showing in both cases ED50 values above 5 micro g/ml.

9301-0282 Anetai, M., Hatakeyama, Y., Yamagishi, T. (Hokkaido Institute of Public Health, North 19, West 12, Kita-ku, Sapporo 060, Japan) **Chemical evaluation of Scopolia rhizome produced in Hokkaido.** *Shoyakugaku Zasshi*, v. 46(3): p. 281-284, 1992 (11 ref, Jap, Eng).

Twenty two rhizome samples of eight *Scopolia* species produced in Hokkaido were analyzed for their tropane alkaloid (scopolamine and hyoscyamine) contents by using reversed phase HPLC. The total amount of the two alkaloids contained in the rhizomes of *S.tangutica* varied from 0.68 to 1.18 percent and in that of *S.lurida* from 0.28 to 1.40 percent. The hyoscyamine and scopolamine contents in the rhizomes of *S.carniolica*, *S.caucasica* and *S.sinensis*, *S.chinensis* were low (0.19-0.31 percent). The average alkaloid content of the rhizomes of *S.stramonifolia* and *S.anomala* was 0.55 percent.

9301-0283 Anjaneyalu, V., Krishna, M.M., Babu, S.J., Babu, B. (Organic Chemistry Laboratories, School of Chemistry, Andhra University, Vishakapatnam 503007, AP, India) **Obtusifoldienol from Mangifera sylvatica Roxb..** *Acta Ciencia Indica*, v. 17C(4): p. 395-400, 1991 (5 ref, Eng).

Isolation of friedelin, friedelan-3-ol, cycloartenol, obtusifoldienol, and beta-sitosterol have been reported from the stem bark of *Mangifera sylvatica*. NSL, New Delhi.

9301-0284 Appendino, G., Ozen, H.C., Tagliapietra, S., Cisero, M. (Dipartimento di Scienze e Tecnologia del Farmaco, via Pietro Giuria 9, I-10125 Torino, Italy) **Coumarins from Heptaptera anisoptera.** *Phytochemistry*, v. 31(9): p. 3211-3213, 1992 (9 ref, Eng).

The roots of *H.anisoptera* gave three sesquiterpene coumarin ethers characterized by a novel oxygenation pattern (C-3, C-11 and C-13) of the drimane moiety.

9301-0285 Arnold, N., Bellomaria, B., Valentini, G., Rafaiani, S.M. (Department of Botany and Ecology, University of Camerino, Italy) **Comparative study on essential oil of some Teucrium species from Cyprus.** *Journal of Ethnopharmacology*, v. 35(2): p. 105-113, 1991 (9 ref, Eng).

A comparative study on the essential oil of *T.cyprium* ssp, *Cyprus micropodioids*, *T.divaricatum* ssp. *canescens* and *T.kotschyanum* has been carried out. The four specimens are found in Cyprus and were used in the traditional medicine of the island. The first three are endemic to Cyprus. The essential oil was extracted by steam distillation of the dried flowers, leaves and stems and analyzed by GLC and GC-MS. The percentage of the essential oil obtained varies in the different parts of the plants from 0.07 to 1.3 percent. Forty-eight components have been identified. Some of them were present in all the species which have been investigated, others were characteristic of one species only.

9301-0286 Atta-ur-Rahman, Ali, S.S., Amad, S., Choudhary, M.I. (H.E.J. Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **A furanoid diterpene from Tinospora malabarica.** *Phytochemistry*, v. 31(9): p. 3155-3157, 1992 (20 ref, Eng).

A new furanoid diterpene, menispermicide and two known compounds palmatine and cycloeuphordenol, have been isolated from the stems of *T.malabarica*. The structures were elucidated on the basis of spectral studies.

9301-0287 Baba, K., Kido, T., Maeda, K., Taniguchi, M., Kozawa, M. (Osaka University of Pharmaceutical Sciences, 2-10-65 Kawai Matsubara-city, Osaka 580, Japan) **Two stilbenoids from Cassia garrettiana.** *Phytochemistry*, v. 31(9): p. 3215-3218, 1992 (5 ref, Eng).

Two new stilbenoids, cassigarol C and cassigarol D, were isolated from the Thai crude drug, Sa mae sarn, (heartwood of *Cassia garrettiana*) and their structures established from spectral and chemical evidence.

9301-0288 Bai, Y., Benn, M. (Chemistry Department, The University, Calgary, Alberta, Canada T2N 1N4) **Norditerpenoid alkaloids of Delphinium leroyi.** *Phytochemistry*, v. 31(9): p. 3243-3245, 1992 (5 ref, Eng).

D.leroyi plants grown from seed of Tanzanian origin yielded six norditerpenoid alkaloids: the known compounds browniine, delcosine, delcosine 14-O-acetate, and deltatine, and two new ones, leroyine and its 14-O-acetate whose structures were established by spectrometric methods.

9301-0289 Banerjee, A. (Centre of Advanced Studies of Natural Products, Chemistry Department, University College of Science, Calcutta University, WB, India) **Studies on natural products.** *Journal of the Indian Chemical Society*, v. 69(2): p. 53-69, 1991 (77 ref, Eng).

The present review deals with the significant contributions made on the chemistry of alkaloids. The following

plants have been dealt with *Alstonia* spp., *Tabernaemontana* and *Rhazya*.

9301-0290 Banerjee, A.K., Jain, M., Dubey, V. (Chemistry Department, University, Sagar, 470003, MP, India) **Constituents of *Basella rubra* seed oil.** *Fitoterapia*, v. 63(4): p. 377, 1992 (3 ref, Eng).

The fatty oil from seeds of *B. rubra* has been found to contain palmitic, oleic, linoleic, linolenic and arachidonic acid. The proteins revealed the presence of lysine, threonine, valine, methionine and leucine.

9301-0291 Baritoux, O., Richard, H., Touche, J., Derbesy, M. (ENSIA Departement Science de l'aliment, 1, Avenue des Olympiades 91305 Massy, France) **Effects of drying and storage of herbs and spices on the essential oil. Part 1. Basil, *Ocimum basilicum* L.** *Flavour and Fragrance Journal*, v. 7(5): p. 267-271, 1992 (20 ref, Eng).

A large sample of fresh basil, (*O. basilicum*) was dried at 45 degree C for 12 hours and stored. After three, six and seven months, qualitative and quantitative analyses of the essential oil were performed by steam distillation and GC-MS. The principal components found in the essential oils were: methylchavicol, eugenol, linalol and 1,8-cineole: the content of methylchavicol and eugenol decreased drastically after drying and storage, while that of linalol and 1,8-cineole increased over the same period. The losses of total essential oil after drying were 19 percent, 62 percent and 66 percent at three, six and seven months storage respectively. Several types of reaction seemed to take place during drying and storage.

9301-0292 Barroso, J.G., Pedro, L.G., Figueiredo, A.C., Pais, M.S.S., Scheffer, J.J.C. (Departamento de Biologia Vegetal, Faculdade de Ciencias de Lisboa, Bloco C-2, Campo Grande, 1700 Lisbon, Portugal) **Seasonal variation in the composition of the essential oil of *Crithmum maritimum* L.** *Flavour and Fragrance Journal*, v. 7(3): p. 147-150, 1992 (7 ref, Eng).

The seasonal variation in the composition of the essential oil of sea fennel, (*C. maritimum*) was studied by GC and GC-MS. Monoterpenes were found to be the major components of the oil, amounting to 97 percent. The sesquiterpenes were present in a relatively small amount, constituting up to 2 percent of the total oil. Although all monoterpenes showed fluctuations in their relative amounts, the most conspicuous ones were recorded for sabinene (7-42 percent) and gamma-terpinene (26-55 percent). For the sesquiterpenes and for dillapiol, the only substituted phenylpropane derivative identified in this oil, of which the concentration ranged from 0.1 to 7 percent, no defined pattern of fluctuation was observed.

9301-0293 Bashyal, B.P., Poudel, G. (Central Research Laboratory, Royal Nepal Academy of Science and Technology, P O Box 3323, Kathmandu, Nepal) **Study on *Melia azedarach* Linn. 1. Composition of fatty oil of *Melia azedarach* Linn.** *Journal of Nepal Chemical Society*, v. 10: p. 25-29, 1991 (18 ref, Eng).

Kernels of *M. azedarach* seeds were extracted with hexane. Physico-chemical properties and the chemical composition of the oil are reported. IR, ¹H NMR and Mass spectra of glycerides, acids, and methyl esters are presented.

9301-0294 Belford, A.L., Lindsay, R.C., Ridley, S.C. (Department of Food Science, University of Wisconsin-Madison, 1605 Linden Drive, Madison, Wisconsin 53706-1565, USA) **Bound vanillin in maple sap.** *Flavour and Fragrance Journal*, v. 7(1): p. 9-13, 1992 (16 ref, Eng).

Analysis of acid and enzymic hydrolysates of maple (*Acer saccharum*) sap and syrup confirmed the presence of vanillin glucoside as a precursor of vanillin in maple syrup. Vanillin glycoside was present at a concentration of about 5 ppm in vacuum-concentrated maple syrup. About 20 percent of the bound vanillin in vacuum concentrated maple syrup was released by either beta-glucosidase or hesperidinase during extended incubations. Small variations in vanillin glycoside concentrations were associated with size of tree and harvest time during the season.

9301-0295 Benayache, S., Benayache, F., Dendougui, H., Jay, M. (Unite de Recherche de Chimie, Universite de Constantine, Route de Ain el Bey 25000, Constantine, Algerie) **Flavonoids of *Inula viscosa* L.** *Plantes Medicinales et Phytotherapie*, v. 25(4): p. 170-176, 1991 (13 ref, Eng, Fre).

Ethylacetate extraction of aerial parts and ethylacetate-benzene (1,1) extraction of exudate of *I. viscosa* afforded seventeen flavonoids. The aglycone fraction seems to be the same in the two extracts. Six flavonoids are reported for the first time in *I. viscosa* and in the Inuleae Tribe.

9301-0296 Benn, M., Were, O. (Chemistry Department, The University, Calgary, Alberta, Canada T2N 1N4) **Ruwenine and ruzorine: Pyrrolizidine alkaloids of *Senecio ruwenzoriensis*.** *Phytochemistry*, v. 31(9): p. 3295-3296, 1992 (12 ref, Eng).

A reinvestigation of Kenyan *S. ruwenzoriensis* reported to contain two alkaloids of unknown structures, ruwenine and ruzorine, resulted in the isolation of the pyrrolizidine alkaloids isoline, accompanied by what appeared to be bisline, two alkaloids previously described as constituents of *S. othonniformis* from South Africa. *S. othonniformis* and *S. ruwenzoriensis* are the same, and it seems highly probable

that ruwenine is the alkaloid now known as isoline, while ruzorine may be bisline.

9301-0297 Bessalle, R., Lavie, D. (Department of Organic Chemistry, The Weizmann Institute of Science, Rehovot 76100, Israel) **Withanolide C, a chlorinated withanolide from *Withania somnifera***. *Phytochemistry*, v. 31(10): p. 3648-3651, 1992 (14 ref, Eng).

The structure of a new chlorinated withanolide isolated from *W. somnifera* chemotype III has been elucidated as 5 α -chloro, 6 β , 14 α , 17 β , 20 α -F-tetrahydroxyl-1-oxo-22R-witha-2,24-dienolide by ¹H and ¹³C NMR and chemical ionization mass spectroscopy methods.

9301-0298 Bestmann, H.J., Pietschmann, M., Vostrowsky, O., Pant, A.K.*, Singh, A.K., Thakur, R.S. (Chemistry Department, GB Pant University of Agriculture and Technology, Pantnagar, India) **Constituents of *Zingiber chrysanthum* Rosc. root oil**. *Journal of Essential Oil Research*, v. 4(5): p. 479-482, 1992 (22 ref, Eng).

Twenty-four components, mainly monoterpenes with the major constituents 1,8-cineole (42 percent), α -fenchyl acetate (15 percent), α -terpineol (6 percent) and camphene (6 percent) of the essential oil from roots of *Z. chrysanthum* were identified by means of GC, GC/MS and GC-FTIR.

9301-0299 Bezanger-Beauquesne, L. (76, rue Jean Bart, 59000 Lille, France) **(New findings in phytotherapy: Ninth review)**. *Plantes Medicinales et Phytotherapie*, v. 25(4): p. 242-277, 1991 (529 ref, Eng, Fre).

Phytochemical and pharmacological activities of medicinal plants published upto 1991 have been reviewed.

9301-0300 Bringmann, G., Kinzinger, L. (Institute of Organic Chemistry, University of Wurzburg, Am Hubland, W-8700 Wurzburg, Germany) **(+)-Ancistrocline, a naphthylisoquinoline alkaloid from *Ancistrocladus tectorius***. *Phytochemistry*, v. 31(9): p. 3297-3299, 1992 (14 ref, Eng).

The completion of the structural elucidation of (+)-ancistrocline, a naphthylisoquinoline alkaloid from *A. tectorius*, by partial synthesis from the known alkaloid, ancistrocladinine, is described. By this transformation, the constitution of (+)-ancistrocline is confirmed, and its stereostructure established as 1R,3S,5S.

9301-0301 Brophy, J.J., Goldsack, R.J. (Department of Organic Chemistry, University of New South Wales, P O Box 1, Kensington, NSW, 2033, Australia) **Leaf essential oil of *Idiospermum australiense* (Diels)** S.T. Blake (*Idiosper-*

maceae). *Flavour and Fragrance Journal*, v. 7(2): p. 79-80, 1992 (13 ref, Eng).

The leaf essential oil obtained from *I. australiense* in 0.3-0.5 percent yield (based on fresh weight) consisted of monoterpenes and sesquiterpenes. Of the 41 compounds detected in amounts 0.05 percent, the principal components were bicyclogermacrene (48 percent) and caryophyllene (8 percent). The tricyclic sesquiterpene alcohols globulol, viridiflorol and spathulenol were also present each in approximately 5 percent amounts.

9301-0302 Brophy, J.J., Boland, D.J. (School of Chemistry, University of New South Wales, P O Box 1, Kensington, NSW 2033, Australia) **The leaf essential oil of *Allosyncarpia ternata* S.T. Blake**. *Flavour and Fragrance Journal*, v. 7(3): p. 117-119, 1992 (8 ref, Eng).

The leaf essential oil from *A. ternata* was found to consist of a mixture of over 60 monoterpenes and sesquiterpenes. The two groups of compounds contributed approximately equal amounts to the oil. The principal monoterpenes were β - and α -pinene and limonene, while the principal sesquiterpenes were β -caryophyllene, globulol and spathulenol.

9301-0303 Brophy, J.J., Lassak, E.V. (Department of Organic Chemistry, University of New South Wales, P O Box 1, Kensington, NSW 2033, Australia) **Steam volatile leaf oils of some *Melaleuca* species from western Australia**. *Flavour and Fragrance Journal*, v. 7(1): p. 27-31, 1992 (12 ref, Eng).

The steam volatile leaf oils of *M. cordata*, *M. halmaturorum* subsp. *cymbifolia*, *M. incana*, *M. lanceolata* subsp. *planifolia*, *M. raphiophylla*, *M. sheathiana* subsp. *sheathiana* and *M. uncinata* were analysed by GC-MS. The oils were entirely terpenoid with the exception of *M. halmaturorum* var. *cymbifolia* which contained small amounts of baecol. Whilst 1,8-cineole was a major constituent of most oils, terpinen-4-ol was the chief constituent of *M. uncinata* oil.

9301-0304 Brunke, E.J., Hammerschmidt, F.J., Schmaus, G. (DRAGOCO Research, D-W-3450 Holzminden, Germany) **Scent of roses - recent results**. *Flavour and Fragrance Journal*, v. 7(4): p. 195-198, 1992 (8 ref, Eng).

The volatiles of four roses with different fragrance types were sampled by dynamic headspace and analysed by GC and GC-MS. The composition of the headspace of the modern English rose 'Othello' was found to be comparable to that of rose oil obtained from *Rosa damascena*. In contrast 'Duchesse de Montebello' *Rosa alba* type was found to contain high concentrations of β -phenylethyl alcohol and β -phenylethyl acetate. 'Lichtkonigin Lucia', a modern

hybrid rose, is characterized by considerable amounts of green notes. The Floribunda grandiflora rose 'Queen Elizabeth' showed completely different pattern with 3,5-dimethoxytoluene, the theaspiranes and ionone derivatives as the main components.

9301-0305 Burzaco, A., Velasco-Negueruela, A., Perez-Alonso, M.J. (Departamento de Biología Vegetal I, Facultad de Biología, Universidad Complutense de Madrid, 28040-Madrid, Spain) **Essential oil analysis of *Sideritis pauli* Pau.** *Flavour and Fragrance Journal*, v. 7(1): p. 47-48, 1992 (17 ref, Eng).

The essential oil from two samples of *S.pauli* was studied by GC, GC-MS and IR after preparative GC. Of forty-two components identified in the volatile oils, alpha-pinene (48.0 percent) was found as the major one.

9301-0306 Calis, I., Hosny, M., Khalifa, T., Ruedi, P. (Hacettepe University, Faculty of Pharmacy, Department of Pharmacognosy, TR-06100 Ankara, Turkey) **Phenylpropanoid glycosides from *Marrubium alysson*.** *Phytochemistry*, v. 31(10): p. 3624-3626, 1992 (10 ref, Eng).

From the aerial parts of *M.alysson* a new phenylpropanoid glycoside, alyssonoside, and five known glycosides, verbascoside (=acteoside), leucosceptoside A, martynoside, forsythoside B and leucosceptoside B were isolated. On the basis of spectral data, the structure of the new compound was elucidated as beta-(3,4-dihydroxyphenyl)ethyl-O-{alpha-L-rhamnopyranosyl-(1-3)}-O-{beta-D-apiopyranosyl-(1-6)}-4-O-feruloyl-beta-D-glucopyranoside.

9301-0307 Calis, I., Yuruker, A., Ruegger, H., Wright, A.D., Sticher, O. (Department of Pharmacognosy, Faculty of Pharmacy, Hacettepe University, TR-06100 Ankara, Turkey) **Triterpene saponins from *Primula veris* subsp. *macrocalyx* and *Primula elatior* subsp. *meyeri*.** *Journal of Natural Products*, v. 55(9): p. 1299-1306, 1992 (13 ref, Eng).

The structures of three new triterpenoid saponins isolated from the roots of *P.veris* subsp. *macrocalyx* have been elucidated.

9301-0308 Chalchat, J.C., Garry, R.Ph., Bastide, P., Fabre, F., Malhuret, R. (Laboratoire de Chimie des Huiles Essentielles, ENS Chimie et Université Blaise Pascal de Clermont, 63177, Aubière Cedex, France) **(Correlation of chemical composition/antimicrobial activity: V-comparison of two methods of determination of MIC).** *Plantes Medicinales et Phytothérapie*, v. 25(4): p. 184-193, 1991 (13 ref, Eng, Fre).

The results obtained for the determination of minimal inhibiting concentrations (MIC) using two modern methods in liquid media were determined; one involving Tween 80 as emulsifier and the other using noble Agar as stabiliser. Three series of tests were carried out: on whole non-phenolic and phenolic essential oils of known chemical composition, on monoterpenes and monoterpenoids, and on oxygenated terpenes. The two methods gave comparable results.

9301-0309 Chalchat, J.C., Garry, R.Ph., Michet, A., Lecomte, E. (Laboratoire de Chimie des Huiles Essentielles, Université Blaise Pascal 63177 Aubière Cedex, France) **Hydroborations of some monoterpenes and sesquiterpenes from essential oils.** *Flavour and Fragrance Journal*, v. 7(3): p. 107-110, 1992 (7 ref, Eng).

Hydroboration was carried out on terpinolene, myrcene, alpha- and beta-cedrene, alpha- and beta-caryophyllene and caryophyllene oxide. Some of the corresponding terpenic alcohols were isolated and characterized. These are potentially of interest as fragrances in perfumery.

9301-0310 Chatzopoulou, P., Katsiotis, S.T., Svendsen, A.B. (Department of Pharmaceutical Technology, School of Pharmacy, Aristotelian University of Thessaloniki, POB 19589, 54006 Thessaloniki, Greece) **An ascaridole containing essential oil of the *Achillea millefolium* L. complex growing wild in northern Greece.** *Journal of the Essential Oil Research*, v. 4(5): p. 457-459, 1992 (7 ref, Eng).

The essential oil of the *A.millefolium* was analyzed by GC and GC/MS. Several monoterpenes and sesquiterpenes were identified, although the main component was ascaridole (47.2 percent). Lesser amounts of 1,8-cineole (10.5 percent), p-cymene (7.4 percent), alpha-terpinene (7.0 percent) and camphor (8.1 percent) were also found.

9301-0311 Chialva, F., Monguzzi, F., Manitto, P. (Centro Studi Maria Branca, Via E.Porro I, I-20158 Milano, Italy) **Composition of the essential oils of five *Salvia* species.** *Journal of Essential Oil Research*, v. 4(5): p. 447-455, 1992 (9 ref, Eng).

From the genus *Salvia* the essential oil composition of five species is reported: *S.canariensis*, *S.confertiflora*, *S.mexicana*, *S.microphylla* (Syn. *S.grahamii*) and *S.somaliensis*. Using GC and GC/MS more than one hundred constituents were found. Among these, alpha-pinene, beta-pinene, camphene, gamma-3-carene and limonene (monoterpene hydrocarbons); 1,8-cineole, camphor, borneol and bornyl acetate (oxygenated monoterpenes); beta-caryophyllene, gamma-murolene,

germacrene B and alpha-copaene (sesquiterpene hydrocarbons); and globulol, guaiol, spathulenol, alpha-eudesmol and beta-eudesmol (oxygenated sesquiterpenes) were the main constituents.

9301-0312 Chiplunkar, Y.G., Nagasampagi, B.A.* (National Chemical Laboratory, Pune 411 008, Maharashtra, India) **Isolation and structure elucidation of a new isopimarane from *Pulicaria wightiana*.** *Journal of Natural Products*, v. 55(9): p. 1328-1329, 1992 (11 ref, Eng).

A new isopimarane (C₂₀H₃₀O₂; mp 155-57 degree) isolated from *P.wightiana*, has been characterized as isopimara-8(14),15-diene-7-keto-2alpha-ol based on spectral data.

9301-0313 Cho, Young-Kyung, Lee, M.W., Kang, H.M., Lee, H.K., Kang, S.S. (Department of Chemistry, Seoul Women's University, Seoul 139-242, Korea) **Acylglucosyl sterols from the roots of *Caragana chamlagu*.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 14-19, 1992 (12 ref, Eng).

A mixture of acylglucosyl sterols together with beta-sitosterol, beta-sitosterol 3-beta-O-glucoside and fatty acid was isolated from the roots of *C.chamlagu* as their acetate forms and their structures elucidated by chemical and spectroscopic means. The major acylglucosyl sterol was beta-sitosteryl 3-O-(6'-O-oleoyl)-beta-D-glucopyranoside while the minor components were 6'-O-palmitoyl- and 6'-O-stearoyl-beta-D-glucosyl sitosterol congeners. The isolation and structure elucidation of these acylglucosyl sterols are reported for the first time from the genus *Caragana*.

9301-0314 Chou, C.J., Lin, L.C., Chen, K.T., Chen, C.F.* (National Research Institute of Chinese Medicine, No.2, Lane 391, Sec.2. Pei-E Road, Shin-Dian, Taipei Hsien 23177, Taiwan, Republic of China) **Novel acetophenones from fruits of *Evodia merrillii*.** *Journal of Natural Products*, v. 55(10): p. 795-799, 1992 (2 ref, Eng).

Four acetophenones, 4-(1'-geranyloxy)-2,6-dihydroxy-3-isopentenylacetophenone, 2-(1'-geranyloxy)-4,6-dihydroxyacetophenone, 4-(1'-geranyloxy)-2,6-dihydroxyacetophenone, and 4-(1'-geranyloxy)-beta,2,6-trihydroxyacetophenone, were isolated along with pachypodol, kumatakenin, retusin, miquelianin, and adenosine from the fruit of *E.mereillii*.

9301-0315 Cravo, L., Perineau, F., Gaset, A., Bessiere, J.M. (Laboratoire de Chimie des Agroressources, ENSCT-INPT, 118, route de Narbonne, 31077 Toulouse Cedex, France) **Study of the chemical composition of the essential oils,**

oleoresin and its volatile product obtained from ambrette (*Abelmoschus moschatus* Moench) seeds. *Flavour and Fragrance Journal*, v. 7(2): p. 65-67, 1992 (11 ref, Eng).

A comparison of the chemical compositions of the essential oil, the oleoresin and the volatile product of the oleoresin of *A.moschatus* is reported for the first time. The three samples were investigated by GC-MS and were found to be similar. The main difference is the lack of the alcoholic compounds (aliphatic alcohols and farnesols) in the oleoresin.

9301-0316 Dagang, W., Sorg, B., Adolf, W., Seip, E.H., Hecker, E. (Kunming Institute of Botany, Chinese Academy of Science, Kunming, Yunnan, China) **Oligo- and macrocyclic diterpenes in Thymelaeaceae and Euphorbiaceae occurring and utilized in Yunnan (Southwest China) 2. Ingenane type diterpene esters from *Euphorbia nematocypha* Hand.-Mazz.** *Phytotherapy Research*, v. 6(5): p. 237-240, 1992 (24 ref, Eng).

The highly irritant new *Euphorbia* factors N1 and N2 were isolated as a mixture from latex of *E.nematocypha*, by a combination of counter current distribution and chromatographic methods. Spectroscopic and chemical analyses revealed their structures to be 3-O-(2,4,6,8-tetradecatetraenoyl) ingenol and 3-O-(2,4,6,8-pentadecatetraenoyl) ingenol, respectively.

9301-0317 De La Torre, M.C., Bruno, M., Piozzi, F., Rodriguez, B., Savona, G., Servetaz, O. (Instituto de Quimica Organica, CSIC, Juan de la Cierva 3, 28006 Madrid, Spain) **Neo-clerodane diterpenoids from *Scutellaria columnae*.** *Phytochemistry*, v. 31(10): p. 3639-3641, 1992 (5 ref, Eng).

Three new neo-clerodane diterpenoids, scutecolumnins A-C, have been isolated from the acetone extract of the aerial parts of *S.columnae* subsp. *columnae*. The structures of these substances were established by spectroscopic means and by comparison with closely related compounds.

9301-0318 Debenedetti, S.L., Nadinic, E.L., Gomez, M.A., Coussio, J.D., De Kimpe, N., Boeykens, M. (Instituto de la Quimica y Metabolismo del Farmaco, Facultad de Farmacia y Bioquimica, Universidad de Buenos Aires, Junin 956, 1113 Buenos Aires, Argentina) **Purpurazol, a highly oxygenated coumarin from *Pterocaulon purpurascens*.** *Phytochemistry*, v. 31(9): p. 3284-3285, 1992 (12 ref, Eng).

A new 6,7,8-trioxygenated coumarin, named purpurazol, was isolated from the aerial parts of *P.purpurascens*. The structural elucidation was performed by spectroscopic analysis including 500 MHz ¹H NMR, ¹³C NMR, IR and EI mass spectral data.

9301-0319 Delgado, G., Sanchez, E., Hernandez, J., Chavez, M.I., Alvarez, L., Martinez, E. (Instituto de Quimica, Universidad Nacional Autonoma de Mexico, Circuito Exterior, Ciudad Universitaria, Coyoacan 04510, Mexico, DF) **Abietanoid acid from *Lepechinia caulescens*.** *Phytochemistry*, v. 31(9): p. 3159-3161, 1992 (22 ref, Eng).

The aerial parts of *L.caulescens* provided the new diterpene 7beta-hydroxy-abietan-8(14)-en-18-oic acid 9alpha,13alpha-endoperoxide which decomposes to 7beta-hydroxy-8alpha,9alpha,13alpha,14alpha-diepoxy-abietan-18-oic acid. Several known acids and flavonoids were also isolated from this species.

9301-0320 Dinda, B., Chel, G. (Department of Chemistry, Tripura University, Agartala 799 004, India) **6-Hydroxyplumbagin, a naphthoquinone from *Plumbago indica*.** *Phytochemistry*, v. 31(10): p. 3652-3653, 1992 (11 ref, Eng).

From the aerial parts of *P.indica*, a new naphthoquinone, as well as plumbagin, sitosterol, stigmasterol and campesterol were isolated. The structure of the new compound is 5,6-dihydroxy-2-methyl-1,4-naphthoquinone or 6-hydroxyplumbagin.

9301-0321 Do, J.C., Yu, Y.J., Jung, K.Y., Son, K.H. (Department of Food and Nutrition, Andong National University, Andong 760 749, Korea) **Flavonoids from the leaves of *Polygala japonica*.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 9-13, 1992 (8 ref, Eng).

From the leaves of *P.japonica*, kaempferol, astragalin, kaempferol 3-O-(6"-O-acetyl)-beta-D-glucopyranoside and kaempferol 3,7-di-O-beta-D-glucopyranoside have been isolated and characterized by chemical and spectral means.

9301-0322 Dong, J.X., Han, G.Y. (College of Pharmacy, Second Military Medical University, Shanghai, 200433, China) **Studies on the active constituents of *Anemarrhena asphodeloides* Bunge.** *Acta Pharmaceutica Sinica*, v. 27(1): p. 26-32, 1992 (11 ref, Chi, Eng).

From the ethanol extract of the *A.asphodeloides*, a new steroidal saponin anemarsaponin B and two known saponins anemarsaponin A1 and A2 were isolated. On the basis of chemical evidences and spectral analysis the structure of anemarsaponin B was elucidated as 26-O-beta-D-glucopyranosylfurost-20(22)-ene-3-beta, 26-diol-3-O-beta-D-glucopyranosyl(1 to 2)-beta-D-galactopyranoside. Preliminary pharmacological test showed anemarsaponin B could inhibit PAF-induced rabbit platelet aggregation in vitro.

9301-0323 El-Kady, A., Lasztity, R., Hidvegi, M., Osman, M.K., Simon-Sarkadi, L. (Rice Research and Training Center, Kafr El-Sheikh, Egypt) **Biological value of maize-fenugreek flour mixture in some food products.** *Acta Alimentaria*, v. 20(3-4): p. 173-181, 1991 (19 ref, Eng).

The gross chemical and amino acid composition and in vitro nutritional qualities of maize (Balady variety), and fenugreek *Trigonella foenum-graecum*; Giza 2 variety) flours, as well as nutritonal and organoleptic qualities of some baked products made from mixtures of maize and fenugreek flours were investigated. Protein content of baked products made from maize and fenugreek flour mixtures was higher as fenugreek ratio increased. Baking resulted in considerable loss percentages in most essential amino acids especially tryptophan, methionine, cystine, phenylalanine and tyrosine, while glutamic acid, threonine, valine and aspartic acid were the most thermostable amino acids. Baking led to marked losses in chemical scores of all type of baked products. Organoleptic evaluation revealed that the addition of 5% and 8% fenugreek flour in the flour mixtures resulted in acceptable products.

9301-0324 Elliger, C.A., Wong, R.Y., Benson, M., Gaffield, W., Weiss, A.C.Jr. (U S Department of Agriculture, Agricultural Research Service, Western Regional Research Center, 800 Buchanan Street, Albany, California 94710, USA) **Diterpenes of *Calibrachoa parviflora*.** *Journal of Natural Products*, v. 55(10): p. 1477-1487, 1992 (24 ref, Eng).

Leaves of *C.parviflora* yielded kauranoids corymbol 6-monoacetate and corymbol 17-monoacetate, corymbol 17-(2-methylbutyrate), and corymbol 6-acetate-17-(2-methylbutyrate). Other new kauranoids were ent-kaurane-7alpha,16beta,17-triol, its 7-acetate, and its 7-acetate-17-(2-methylbutyrate), the corresponding 7-ketodiol and its 17-acetate. New pimaranes were 15R,16-dihydroxy-ent-isopimar-8(14)-en-7-one and the ring-closed analogues, 14alpha,16-oxido-ent-isopimar-7-en-15alpha-ol and 14alpha,16-oxido-ent-isopimar-7-ene-6alpha-15alpha-diol. The known diterpenes, ent-kaurane-16beta,17-diol, its 17-acetate, ent-kaurane-6alpha,16beta,17-triol (corymbol), and its 6,17-diacetate were also obtained.

9301-0325 Faini, F., Labbe, C., Polanco, M.I. (Departamento de Quimica, Facultad de Ciencias, Universidad de Chile, Casilla 653, Santiago, Chile) **Diterpenoids from *Baccharis neaei*.** *Phytochemistry*, v. 31(9): p. 3274-3276, 1992 (12 ref, Eng).

Four new ent-labdanes have been isolated from *B.neaei*. Structures are proposed on spectroscopic and chemical evidence.

9301-0326 Fakunle, C.O., Connolly, J.D., Rycroft, D.S.(Department of Chemistry, Obafemi, Awolowo University, Ile-Ife, Nigeria) **Enukokurin B and C, two other new jatrophone diterpenoid esters from the latex of *Euphorbia laterifolia*.** *Fitoterapia*, v. 63(4): p. 329-332, 1992 (7 ref, Eng).

Two additional new jatrophone diterpenoid esters enukokurin B and C were isolated from the latex of *E.laterifolia*. Their structures were elucidated by spectral correlation with enukokurin A, earlier isolated from the same source and by 2D-delta H/delta C direct and long-range correlation experiments.

9301-0327 Fazio, C., Passannanti, S., Paternostro, M.P., Piozzi, F.(Dipartimento di Chimica Organica, Universita di Palermo, Archirafi 20, 90123 Palermo, Italy) **Neoclerodane diterpenoids from *Stachys rosea*.** *Phytochemistry*, v. 31(9): p. 3147-3149, 1992 (18 ref, Eng).

From the aerial of *S.rosea* two neo-clerodane diterpenoids, roseostachenone and roseostachone, were isolated. The structures of roseostachenone (2-oxo-13-hydroxy-neocleroda-3,14-diene) and roseostachone (3-oxo-13-hydroxy-4alpha-neo-clerod-14-ene) were established by spectroscopic means.

9301-0328 Figueiredo, A.C., Barroso, J.G., Pais, M.S.S., Scheffer, J.J.C.(Departamento de Biologia Vegetal, Faculdade de Ciencias de Lisboa, Bloco C-2, Campo Grande, 1700 Lisbon, Portugal) **Composition of the essential oils from leaves and flowers of *Achillea millefolium* L. ssp. *millefolium*.** *Flavour and Fragrance Journal*, v. 7(4): p. 219-222, 1992 (19 ref, Eng).

The composition of the essential oils from leaves and from flowers of *Achillea millefolium* ssp. *millefolium* was analysed by GC and GC-MS. During the flowering period of the plant, both oils consisted mainly of monoterpenes (about 80 percent). 1,8-Cineole was the dominant component in the oils from the flowers (29 percent) and from the leaves (25 percent), while sabinene was the second most important component in the oil from the flowers (15 percent) and trans-sabinene hydrate in that from the leaves (10 percent). The sesquiterpene fraction was in both cases dominated by germacrene-D (0.7 percent in the oil of the flowers and 7 percent in the leaf oil). In the essential oil isolated from leaves collected during the vegetative phase, the monoterpene fraction was small (percent), whereas sesquiterpenes amounted to 92 percent, germacrene-D being the major component (65 percent) of the oil.

9301-0329 Fraga, B.M.(Institute de Productos Naturales, Organicos CSIC La Laguna 38206 Tenerife, Canary, Islands, Spain) **Natural sesquiterpenoids.** *Natural Product Reports*, v. 9(3): p. 217-241, 1992 (307 ref, Eng).

Present article reviews literature published during 1989 on natural farnesane, mono and bi-cyclofarnesanes, bisabolane, sesquipinane and sesquicamphane, trichothecane, herbertane, cuparane and laurane, chamigrane and rhodolarirane, carotane, caryophyllane, germacrane, elemene, eudesmane, vetisperane, eremophilane, guaiane, pinguicane and other miscellaneous sesquiterpenoids.

9301-0330 Fujita, T., Nakayama, M.(Department of Agricultural Chemistry, College of Agriculture, University of Osaka Prefecture, Sakai, Osaka 593, Japan) **Perilloside A, a monoterpene glucoside from *Perilla frutescens*.** *Phytochemistry*, v. 31(9): p. 3265-3267, 1992 (13 ref, Eng).

A new monoterpene glucoside named perilloside A has been isolated from the fresh leaves of *P.frutescens*. Its structure has been characterized on the basis of spectral and chemical evidence.

9301-0331 Gadre, A., Gabhe, S.Y (C.U.Shah College of Pharmacy, SNDT Women's University, Juhu Campus, Santacruz (W), Bombay 400049, Maharashtra, India) **Identification of some sterols of *Tridax procumbens* by GC-MS.** *Indian Journal of Pharmaceutical Sciences*, v. 54(5): p. 191-192, 1992 (9 ref, Eng).

GC-MS analysis of the unsaponifiable fraction of petroleum ether fraction of *T.procumbens* has revealed the presence of campesterol, stigmasterol, and beta-sitosterol in it.

9301-0332 Gao, J., Yue, D.C., Cheng, K.D., Wang, S.C., Yu, K.B., Zheng, Q.T., Yang, J.S.(Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100050, China) **Gloeosteretriol, a new sesquiterpene from the fermentation products of *Gloeostereum incarnatum* S.Ito et Imal.** *Acta Pharmaceutica Sinica*, v. 27(1): p. 33-36, 1992 (3 ref, Chi, Eng).

A new sesquiterpenoid, named gloeosteretriol, C₁₅H₂₆O₃, mp 205-206 degree C, was isolated from the fermentation product of *G.incarnatum*. On the basis of spectral analysis its structure was deduced and confirmed by single crystal X-ray analysis.

9301-0333 Garg, S.C., Dengre, S.L.(Department of Chemistry, University of Saugar, Saugar, 470 003, MP, India) **Composition of the essential oil from the leaves of *Buddleia asiatica* Lour.** *Flavour and Fragrance Journal*, v. 7(3): p. 125-127, 1992 (9 ref, Eng).

The essential oil, obtained from the shade-dried leaves of *B.asiatica* by hydrodistillation in a yield of 0.3 percent, was analysed by chromatographic spectroscopic and chemical methods. Eighteen components including various monoterpenoids and sesquiterpenoids were characterized and measured by area normalization. The oil was found rich in beta-caryophyllene oxide (21.7 percent, citronellol (16.7 percent) and beta-caryophyllene (15.8 percent). Five minor components (3.1 percent) remained uncharacterized. The oil has been reported to possess good in vitro antifungal, antibacterial and anthelmintic activity.

9301-0334 Garg, S.N., Siddiqui, M.S., Agarwal, S.K.(Phytochemistry Division, Central Institute of Medicinal and Aromatic Plants, Lucknow 226 016, UP, India) **New fatty acid esters and hydroxy ketones from fruits of *Laurus nobilis*.** *Journal of Natural Products*, v. 55(9): p. 1315-1319, 1992 (15 ref, Eng).

Three new compounds, isolated from the fruits of *Laurus nobilis*, have been characterized as 10-hydroxyoctacosanyl tetradecanoate(C₄₂H₈₄O₃; mp 43-45 degree), 1-docosanol tetradecanoate(C₃₆H₇₂O₂), and 11-hydroxytriacontan-9-one(C₃₀H₆₀O₂).

9301-0335 Goh, S.H., Jantan, I., Waterman, P.G.(Chemistry Department, University of Malaya, 59100 Kuala Lumpur, Malaysia) **Neoflavonoid and biflavonoid constituents of *Calophyllum inophylloide*.** *Journal of Natural Products*, v. 55(10): p. 1415-1420, 1992 (11 ref, Eng).

A new neoflavonoid, (+)-(2R,3S)-2,3-dimethyl-5-hydroxy-6-(3-methylbut-2-enyl)-7-methoxy-8-(2-carboxyl-1-phenylethyl)-2,3-dihydrobenzopyran, and a new biflavonoid, pyranoamentoflavone, have been isolated and characterized from the heartwood extractives of *C.inophylloide*. Other compounds present were amentoflavone, friedelin, and canophyllol.

9301-0336 Gonda, R., Tomoda, M., Takada, K.* , Ohara, N., Shimizu, N.(Kyoritsu College of Pharmacy, Shibakoen, Minato-ku, Tokyo 105, Japan) **The core structure of ukonan A, a phagocytosis-activating polysaccharide from the rhizome of *Curcuma longa*, and immunological activities of degradation products.** *Chemical and Pharmaceutical Bulletin*, v.40(4):p. 990-993, 1992 (28 ref, Eng).

The controlled Smith degradation of ukonan A, a phagocytosis-activating polysaccharide isolated from the rhizome of *C.longa* was performed. The reticuloendothelial system-potentiating, anti-complementary and alkaline phosphatase-inducing activities of ukonan A and its degradation products were investigated. Methylation analyses of both the primary and the secondary Smith

degradation products indicated that the core structural features of ukonan A include a backbone chain. Ukonan A has a remarkable effect on each of the three kinds of immunological activities. Periodate oxidation caused pronounced decrease or disappearance of the activities, but the controlled Smith degradation product having the core structure of polysaccharide showed considerable restoration of these activities.

9301-0337 Gosh, S.(Department of Chemistry, JB College, Jorhat, Assam, India) **Phytochemical investigations on the leaves of *Evodia meliaefolia* Benth..** *Journal of Biological Science Society of North East India*, v. 1: p. 50-51, 1991 (3 ref, Eng).

Finely powdered leaves of *E.meliaefolia* has yielded taraxerone, taraxerol and a pentacyclic triterpene. NSL, New Delhi.

9301-0338 Grancaiova, Z., Masterova, I., Suchy, V.(Department of Pharmacognosy and Botany, Comenius University, 83232 Bratislava, Czech and Slovak Federal Republic) **Constituents of *Muscari armeniacum*.** *Fitoterapia*, v. 63(4): p. 380, 1992 (4 ref, Eng).

Three homoisoflavanones have been isolated from the bulbs of *M.armeniacum* and identified.

9301-0339 Gurkan, E., Rollas, S.(Faculty of Pharmacy, University of Marmara, Nisantasi, Istanbul, Turkey) **Constituents of *Brassica oleraceae* var.capitata leaf juice purified ethanol extract.** *Fitoterapia*, v. 63(4): p. 381, 1992 (3 ref, Eng).

The following constituents were isolated from the leaf juice purified ethanol extract of *B.oleracea* var. *capitata*: alkanes, alkenes, fatty acids, benzophenones, monobutylphthalate, monoethylphthalate, isothiocyanates and some cyanides.

9301-0340 Hanada, R., Abe, F., Mori, Y., Yamauchi, T.*(Faculty of Pharmaceutical Sciences, Fukuoka University, 8-19-1 Nanakuma, Jonan-ku, Fukuoka 81401, Japan) **Reinvestigation of cardenolide glycosides from seeds of *Anodendron affine*.** *Phytochemistry*, v. 31(10): p. 3547-3551, 1992 (10 ref, Eng).

Cardenolide glycosides from the seeds of *A.affine* were reinvestigated. Five doubly linked cardenolide glycosides, designated affinosides P-T, and three normally linked sarmentogenin and affinogenin A glycosides were newly isolated, along with affinosides A, K, M and other known glycosides.

9301-0341 Hanada, R., Abe, F., Yamauchi, T.(Faculty of Pharmaceutical Sciences, Fukuoka University, 8-19-1

Nanakuma, Jonan-ku, Fukuoka 814-01, Japan) **Steroid glycosides from the roots of *Nerium odorum*.** *Phytochemistry*, v. 31(9): p. 3183-3187, 1992 (16 ref, Eng).

As minor cardenolide glycosides from the roots of *N.odorum*, digitoxigenin beta-gentiotriosyl-(1-4)-beta-D-digitaloside, uzarigenin beta-gentiobiosyl-(-4)-beta-D-digitaloside and 5alpha-oleandrigenin glycosides were obtained along with 40 known cardenolide ingredients. 5alpha-Pregnanolone bis-O-beta-D-glucosyl-(-2,1-6)-beta-D-glucoside and pregnonolone beta-D-apiosyl-(1-6)-beta-D-glucoside were accompanied by cardenolide glycosides.

9301-0342 Hanson, J.R.(School of Molecular Sciences, University of Sussex, Brighton Sussex, BN1 9QJ) **The sesterterpenoids.** *Natural Product Reports*, v. 9(5): p. 481-489, 1992 (77 ref, Eng).

Present review covers the literature published between July 1985 and October 1990, on linear sesterterpenoids, mono-and bi-carbocyclic sesterterpenoids, tricarbocyclic sesterterpenoids of cheilanthene type and other sesterterpenoids from higher plants.

9301-0343 Hanson, J.R.(School of Molecular Sciences, University of Sussex, Brighton, Sussex BN1,9QJ) **Diterpenoids.** *Natural Product Reports*, v. 9(1): p. 1-16, 1992 (237 ref, Eng).

Present report reviews literature published on diterpenoids between January and December 1990. Many new diterpenoids have been reported as a result of phytochemical research on different plants especially belonging to families Compositae, Labiatae, Euphorbiaceae, Cistaceae, Rubiaceae, Annonaceae etc. which exhibit diverse biological activities.

9301-0344 Hashidoko, Y., Tahara, S., Mizutani, J.(JRDC Plant Ecochemicals Project, Eniwa RBP Centre Building, Megumino Kita 3-Chome, Eniwa-shi, Hokkaido 061-13, Japan) **Long chain alkyl esters of 4'-hydroxycinnamic acids from leaves of *Rosa rugosa*.** *Phytochemistry*, v. 31(9): p. 3282-3283, 1992 (4 ref, Eng).

Two novel long chain alkyl esters of cinnamic acid, 4'-hydroxy-cis-cinnamic acid docosyl ester and 4'-hydroxy-2,3-dihydrocinnamic acid pentacosyl ester, in association with known 4'-hydroxy-cis-cinnamic acid hexacosyl ester and octacosyl ester, were isolated from the leaves of *R.rugosa*.

9301-0345 Hassanean, H.A., Desoky, E.K.(Pharmacognosy Department, Assiut University, Faculty of Pharmacy, Assiut, Egypt) **An acylated isorhamnetin glucoside from**

***Zygophyllum simplex*.** *Phytochemistry*, v. 31(9): p. 3293-3294, 1992 (12 ref, Eng).

From the aerial parts of *Z.simplex* a new glycoside was isolated and identified as 6''-(2-E-butenoyl) isorhamnetin-3-O-glucoside in addition to the known compounds: isorhamnetin, isorhamnetin 3-O-glucoside, kaempferol 3-O-rutinoside, sitosterol glucoside and quinovic acid 3-alpha-L-rhamnoside. The structures of the isolated compounds were elucidated by spectral analysis.

9301-0346 Herderich, M., Neubert, C., Winterhalter, P., Schreier, P., Skouroumounis, G.K.(Lehrstuhl für Lebensmittelchemie der Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany) **Identification of C13-norisoprenoid flavour precursors in starfruit (*Averrhoa carambola* L.).** *Flavour and Fragrance Journal*, v. 7(4): p. 179-185, 1992 (42 ref, Eng).

HRGC and HRGC-MS identifications of glycosidically bound constituents from starfruit (*A.carambola*) were achieved in extracts isolated by Amberlite XAD-2 adsorption followed by methanol elution. The majority of aglycones released by almond beta-glucosidase hydrolysis were carotenoid degradation products, including megastigma-6,7-diene-3,5,9-triol, an important precursor of the potent aroma compound beta-damascenone. Additional aglycones comprised the following ionone derivatives: 4-hydroxy-beta-ionol, 3-hydroxy-beta-ionol, 4-oxo-beta-ionol, 3-hydroxy-beta-ionone, 3-oxo-alpha-ionol, 3-oxo-retro-alpha-ionol (2 isomers), 3-oxo-4,5-dihydro-alpha-ionol, 3-oxo-7,8-dihydro-alpha-ionol ('blumenol C'), 3-hydroxy-beta-damascone, 3,5-dihydroxy-megastigma-6,7-diene-9-one ('grasshopper ketone'), 3-hydroxy-5,6-epoxy-beta-ionone, 3-hydroxy-5,6-epoxy-beta-ionol, 3,4-dihydro-3-hydroxyactinidol, vomifoliol ('blumenol A'), 4,5-dihydrovomifoliol, and 7,8-dihydrovomifoliol ('blumenol B').

9301-0347 Hernandez, J., Delgado, G.(Instituto de Quimica de La Universidad Nacional Autonoma de Mexico, Circuito Exterior, Ciudad Universitaria, Coyoacan 04510, Mexico, D.F.) **Terpenoids from aerial parts of *Croton draco*.** *Fitoterapia*, v. 63(4): p. 377-378, 1992 (6 ref, Eng).

Isolation of beta-sitosterol, stigmasterol, a mixture of polyprenols being cataprenol-11, vomifoliol and ergasterol -5-alpha-8-alpha-endoperoxide from aerial parts of *C.draco* is reported.

9301-0348 Heur, Y.H., Zeng, W., Stoner, G.D., Nemeth, G.A., Hilton, B.(Department of Pathology, Medical College of Ohio, Health Education Building, Room 202, Toledo 43614 OH, USA) **Synthesis of ellagic acid O-alkyl derivatives and isolation of ellagic acid as a**

tetrahexanoyl derivative from *Fragaria ananassa*. *Journal of Natural Products*, v. 55(10): p. 1402-1407, 1992 (14 ref, Eng).

Ellagic acid, a gallic acid dimer that occurs in plants, has been shown to inhibit cancer induced by several types of chemical carcinogens. Ellagic acid was isolated as a tetrahexanoyl derivative from *F. ananassa* and identified by ¹³C and ¹H NMR and MS. Two new derivatives of ellagic acid, 3,3'-di-beta-D-glucopyranosylellagic acid decaacetate and 3,3'-di-n-octyl-4,4'-dihexanoylellagic acid, were also synthesized. Both derivatives were less effective as inhibitors of benzo(a)pyrene tumorigenesis in the lungs of strain A/J mice than ellagic acid.

9301-0349 Hisham, A.K., Pieters, L., Schepens, P., Vlietinck, A.J. (Department of Pharmaceutical Sciences, University of Antwerp Universiteitsplein 1, B-2610 Antwerp, Belgium) **The root bark essential oil of *Uvaria narum* Wall.** *Journal of Essential Oil Research*, v. 4(5): p. 475-477, 1992 (10 ref, Eng).

The constituents of the root bark essential oil of *U. narum* were analyzed by GC/MS. About 52 components were detected, out of which 22 were identified. Bornyl acetate (15.2 percent) and patchoulone (8.1 percent), a tricyclic sesquiterpene ketone, were found to be the major individual constituents of the oil.

9301-0350 Hosny, M., Khalifa, T., Calis, I.* , Wright, A.D., Sticher, O. (Hacettepe University, Faculty of Pharmacy, Department of Pharmacognosy, TR-06100, Ankara, Turkey) **Balanitoid, a furostanol glycoside, and 6-methyl-diosgenin from *Balanites aegyptiaca*.** *Phytochemistry*, v. 31(10): p. 3565-3569, 1992 (13 ref, Eng).

In addition to a known spirostanol glycoside, balanitin-3, and a new sapogenol, 6-methyldiosgenin, a new furostanol saponin, balanitoid has been isolated from the fruits (mesocarp) of *B. aegyptiaca*. The structure of the glycoside has been determined as 26-O-beta-D-glucopyranosyl-3beta,22,26-trihydroxy-furost-5-ene 3-O-alpha-L-rhamnopyranosyl-(1-2)-beta-D-glucopyranosyl-(1-4)-beta-D-glucopyranoside, on the basis of spectroscopic and chemical evidence.

9301-0351 Ikuta, A., Morikawa, A. (The Research Institute for Biosciences, Science University of Tokyo, 2669 Yamazaki, Noda City, Chiba, Japan) **Triterpenes from *Stauntonia hexaphylla* callus tissues.** *Journal of Natural Products*, v. 55(9): p. 1230-1233, 1992 (8 ref, Eng).

Structure of a new triterpene isolated from the extract of *S. hexaphylla* callus tissues was elucidated as 3alpha-hydroxy-11alpha, 12alpha-epoxyoleanan-28, 13beta-olide

by ¹H-NMR, ¹³C-NMR, and MS spectroscopic studies. Two known compounds, 28-norolean-12-ene-3beta-17beta-diol and 11alpha-hydroxy-beta-amyrin, were also isolated.

9301-0352 Inagawa, H., Nishizawa, T., Tsukioka, D., Suda, T., Chiba, Y., Okutomi, T., Morikawa, A., Soma, G.I., Mizuno, D.I. (Biotechnology Research Center, Teikyo University, Nogawa, Miyamae-ku, Kawasaki 216, Japan) **Homeostasis as regulated by activated macrophage. II. LPS of plant origin other than wheat flour and their concomitant bacteria.** *Chemical and Pharmaceutical Bulletin*, v. 40(4): p. 994-997, 1992 (16 ref, Eng).

In order to seek a macrophage-activating substance, lipopolysaccharide (LPS) of plant origin other than that of wheat flour was surveyed. A large amount of LPS (10-100 microg/g) was detected in *Laminaria japonica* (kelp), *Curcuma longa* (turmeric), *Undaria pinnatifida* and other substances. Since concomitant bacteria possibly existing in root of farm products can be considered to contribute to LPS of plant origin, a count was taken of bacterial cells both dead and alive. This count revealed that some LPS were derived from concomitant bacteria which had probably come from root. Few concomitant bacterial cells were found in seaweed, while stem-root contained enough bacterial cells. These LPSs were purified and their chemical compositions were examined. They are similar to that of *Escherichia coli* except that their molecular sizes are smaller. Since LPS is non-toxic when taken orally or percutaneously, these LPSs may also be advantageous in the cure of intractable diseases.

9301-0353 Inoue, T., Sakurai, N., Nagai, S., Nagai, M. (Faculty of Pharmaceutical Sciences, Hoshi University, Ebara 2-4-41, Shinagawa-ku, Tokyo 142, Japan) **Studies on the constituents of Aceraceae plants (X). Isolation of flavonoid glycosides and a cerebroside from the leaves of *Acer negundo*.** *Shoyakugaku Zasshi*, v. 46(3): p. 261-264, 1992 (9 ref, Eng).

Acer-cerebroside was isolated from the leaves of *A. negundo* together with taraxerol acetate and flavonoid glycosides. Acer-cerebroside was shown to be a mixture of geometrical isomers (8E and 8Z) of 1-O-beta-D-glucopyranosyl-2-N-2'-hydroxypalmitoyl-sphing-4E,8-dienine, on the basis of the chemical and spectral evidences.

9301-0354 Jia, Z.J., Chen, H.M., Qiu, J.L., Wang, Q.G. (Institute of Organic Chemistry, Lanzhou University, Lanzhou 730 000, People's Republic of China) **The structure of sagittolactone.** *Chinese Science Bulletin*, v. 37(9): p. 773-774, 1992 (2 ref, Eng).

From the rhizomes of *Ligularia sagitta* a lactone of new carbon skeleton, sagittolactone (C₁₉H₂₄O₅, mp 266-68 degree) was isolated and identified.

9301-0355 Jia, Z.J., Ju, Y. (Institute of Organic Chemistry, State Key Laboratory of Applied Organic Chemistry, Lanzhou University, Lanzhou 730000, P.R.China) **Steroidal saponins from *Smilax lebrunii*.** *Phytochemistry*, v. 31(9): p. 3173-3175, 1992 (6 ref, Eng).

Two new steroidal saponins, (25R)-spirostan-3 β -ol-6-one-3-O-{ α -L-arabinopyranosyl(1-6)}- β -D-glucopyranoside and (25R)-spirostan-3 β -ol-6-one-3-O- β -D-glucopyranosyl(1-4){ α -L-arabinopyranosyl(1-6)}- β -D-glucopyranoside, were isolated from the rhizomes of *S.lebrunii*. Their structures have been established by chemical and spectral methods.

9301-0356 Jingrong Li, Hongmei Yuan, Mingshi Wang (Department of Phytochemistry, China Pharmaceutical University Nanjing, Nanjing, 210 009, People's Republic of China) **Two flavanones from the root bark of *Lespedeza formosa*.** *Phytochemistry*, v. 31(10): p. 3664-3665, 1992 (7 ref, Eng).

Two new flavanones have been isolated from the root bark of *L.formosa* and their structures established as 6,3'-di-gamma,gamma-dimethylallyl-8-methyl-4'-methoxy-5,7-dihydroxy-(2S)-flavanone and 8,3'-di-gamma,gamma-dimethylallyl-6-methyl-4'-methoxy-5,7-dihydroxy-(2S)-flavanone on the basis of spectroscopic evidence.

9301-0357 Jirovetz, L., Gonzalez, J.E., Silvera, G., Nikiforov, A., Woidich, A. (Institute of Pharmaceutical Chemistry, University of Vienna, Waehringerstrasse 10, A-1090 Vienna, Austria) **Volatile constituents of *Peristeria elata* (Orchidaceae).** *Journal of Essential Oil Research*, v. 4(5): p. 435-438, 1992 (14 ref, Eng).

Five samples of *P.elata* were analyzed by GC, GC/MS and GC/FTIR to determine the volatile constituents of this odorous flower from Panama. Although more than thirty components could be identified by these coupling techniques, 2-phenylethanol, 2-phenylethyl acetate, phenol and 1,8-cineole were considered to be important components of the aroma of the flower of *P.elata* as determined by a GC-sniffing technique.

9301-0358 John, L.M.D., Tinto, W.F.* (Centre for Natural Products Chemistry, University of Guyana, Georgetown, Guyana) **Revised ¹³C-NMR assignments for the biologically active butyrolactone (-)-trachelogenin.** *Journal of Natural Products*, v. 55(9): p. 1313-1314, 1992 (11 ref, Eng).

The biologically active butyrolactone (-)-trachelogenin was isolated from the leaves of *Glycydendron amazonicum*. The ¹³C-NMR assignments have been revised on the basis of a 2D NMR analysis.

9301-0359 Jong, T.T., Hwang, H.C., Jean, M.Y., Wu, T.S., Teng, C.M. (Department of Chemistry, National Chungshing University, Taichung, Taiwan, Republic of China) **An antiplatelet aggregation principle and X-ray structural analysis of cis-khellactone diester from *Peucedanum japonicum*.** *Journal of Natural Products*, v. 55(10): p. 1396-1401, 1992 (11 ref, Eng).

Three structurally related khellactone coumarins, were isolated from the aerial parts of *P.japonicum*. Compound (C₂₄H₂₈O₇; mp 103-4 degree) was identified as a new coumarin (cis-3'-isovaleryl-4'-seneciolykhellactone) by spectral and chemical analysis. Conformation of the dihydropyrano ring of cis-3', 4'-diseneciolykhellactone (C₂₄H₂₆O₇; mp 113-14 degree) was elucidated by X-ray crystallographic analysis. These three natural khellactone esters were subjected to the antiplatelet aggregation bioassay where cis-3',4'-diisovalerylkhellactone (C₂₄H₃₀O₇; mp 85-86 degree) showed significant activity (at 50 microg/ml).

9301-0360 Jong-Woong Ahn, Mi-Ja Ahn, Ok-Pyo Zee, Eun-Joo Kim, Sueg-Geun Lee, Hyung Jin Kim, Kubo, I. (Natural Products Laboratory, Korea Research Institute of Chemical Technology, P O Box 9, Daedeog-Danji, Daejeon, Korea) **Piperidine alkaloids from *Piper retrofractum* fruits.** *Phytochemistry*, v. 31(10): p. 3609-3612, 1992 (10 ref, Eng).

Two new piperidine alkaloids, piperoctadecalidine and pipereicosalidine have been isolated from the fruits of *P.retrofractum* along with two known piperidine alkaloids piperine and pipernonaline. The structures of the new compounds were determined to be (2E,4E,14Z)-N-(2,4,14-octadecatrienoyl) piperidine and (2E,4E,16Z)-N-(2,4,16-eicosatrienoyl) piperidine, respectively, by spectral and synthetic methods.

9301-0361 Joshi, B.S., Moore, K.M., Pelletier, S.W., Puar, M.S., Pramanik, B.N. (Institute for Natural Products Research and Department of Chemistry, The University of Georgia, Georgia 30602, Athens, USA) **Saponins from *Collinsonia canadensis*.** *Journal of Natural Products*, v. 55(10): p. 1468-1476, 1992 (22 ref, Eng).

Akeboside Stb (C₃₅H₅₆O₈; mp 233-34 degree) and two new saponins named collinsonin and collinsonidin were isolated from the roots of *C.canadensis*. On the basis of chemical and spectral studies, the structure of collinsonin (C₃₅H₅₆O₉.H₂O; mp 266-67 degree) has been established

as 3-O- α -L-arabinopyranosylcollinsogenin. 16- α -Hydroxyhederagenin, obtained by the hydrolysis of collinsonin, is a new saponin named collinosgenin. Collinsonidin (C₄₁H₆₆O₁₃; mp 250-52 degree) has been identified as 3-O- β -D-glucopyranosyl-(1"-3')- α -L-arabinopyranosylhederagenin.

9301-0362 Kajiyama, K., Demizu, S., Hiraga, Y., Kinoshita, K., Koyama, K., Takahashi, K., Tamura, Y., Okada, K., Kinoshita, T. (Meiji College of Pharmacy at Setagaya, 1-35-23 Nozawa, Setagaya-ku, Tokyo 154, Japan) **New prenylflavones and dibenzoylmethane from *Glycyrrhiza inflata*.** *Journal of Natural Products*, v. 55(9): p. 1197-1203, 1992 (15 ref, Eng).

Two new prenylflavones, licoflavones B and C, and one new dibenzoylmethane, glycyrdione C, were isolated from the root of *G. inflata* together with two known flavones, licoflavone A and 4',7-dihydroxyflavone. The structures of new compounds were elucidated on spectroscopic evidence as 4',7-dihydroxy-3',6-diprenylflavone, 8-prenyl-4',5,7-trihydroxyflavone, and 1-(2,2-dimethyl-7-hydroxy-2H-1-benzopyran-6-yl)-3-(4-hydroxy-3-prenyl-phenyl)-1,3-propanedione. The structure of a prenylflavone that was isolated from *Marshalli grandiflora*, previously determined as 4',5,7-trihydroxy-8-(3,3-dimethylallyl)-flavone, was revised to 6-prenyl-4',5,7-trihydroxyflavone.

9301-0363 Kakuno, T., Yoshikawa, K.*, Arihara, S. (Faculty of Pharmaceutical Sciences, Tokushima-Bunri University, Tokushima-shi, Tokushima 770, Japan) **Triterpenoid saponins from *Ilex crenata* fruit.** *Phytochemistry*, v. 31(10): p. 3553-3557, 1992 (6 ref, Eng).

Six new saponins named ilexosides IX-XIV, have been isolated from the fresh fruits of *I. crenata*. Their structures were established on the basis of spectral and chemical evidence.

9301-0364 Kang, S.S. (National Products Research Institute, Seoul National University, Seoul 110 460, Korea) **Studies on flavonoids from *Epimedium* plants.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 1-8, 1992 (55 ref, Kor).

Only title translated.

9301-0365 Kapadia, G.J., Shah, N.J. (College of Pharmacy and Pharmacal Sciences, Howard University, Washington DC 20059, USA) **Isolation of quaternary alkaloids of *Magnolia acuminata*.** *Indian Journal of Pharmaceutical Sciences*, v. 54(4): p. 142-144, 1992 (9 ref, Eng).

Identification of four quaternary alkaloids, choline, magnocurarine, magnoflorine and silicifoline isolated from *M. acuminata* stem has been reported.

9301-0366 Khan, I.A., Erdelmeier, C.A.J., Sticher, O., Rali, T. (Department of Pharmacy, Swiss Federal Institute of Technology (ETH) Zurich, CH-8092 Zurich, Switzerland) **New phenolic glucosides from the leaves of *Eurya tigang*.** *Journal of Natural Products*, 1992 (16 ref, Eng).

Three new compounds, 6'-O-coumaroyl-1'-O-{2-(4-hydroxyphenyl)ethyl}- β -D-glucopyranoside (eutigoside A), 6'-O-coumaroyl-1'-O-{2-(1-hydroxy-4-oxo-2,5-cyclohexadien-1-yl)ethyl}- β -D-glucopyranoside (eutigoside B), and 6'-O-cinnamoyl-1'-O-{2-(1-hydroxy-4-oxo-2,5-cyclohexadien-1-yl)ethyl}- β -D-glucopyranoside (eutigoside C) were isolated from the leaves of *E. tigang*, along with other known compounds (afzelin, quercitrin, p-coumaric acid, methyl- α -D-fructofuranoside, isorengeol, and euryanoside). Their structures were determined by chemical and spectroscopic methods.

9301-0367 Khan, M.R., Rwekika, E. (Department of Chemistry, University of Dar es Salaam, P.O. Box 35061, Dar es Salaam, Tanzania) **Triterpenoids from the leaves of four species of family Ebenaceae.** *Fitoterapia*, v. 63(4): p. 375-376, 1992 (2 ref, Eng).

Isolation of lupeol and betulinic acid from leaves of *Diospyros greeniway*; α -amyrin, lupeol and betulinic acid from leaves of *D. mafiensis*, *D. natalensis* and *Euclea natalensis* is reported.

9301-0368 Khan, M.S., Shafiullah, kamil, M., Ilyas, M. (Section of Natural Products, Department of Chemistry, Aligarh Muslim University, Aligarh 202002, UP, India) **Phytochemical investigation on the leaves of *Argyrea speciosa*.** *Journal of Indian Chemical Society*, v. 69(2): p. 110, 1992 (5 ref, Eng).

Air dried roots of *A. speciosa* on extraction with methanol afforded quercetin, kaempferol-3-O-L-rhamnopyranoside and kaempferol.

9301-0369 Kim, C.W., Takao, N., Ichimaru, M., Kato, A. (Kobe Women's College of Pharmacy, 4-19-1, Motoyamakita-machi, Higashinada-ku, Kobe 658, Japan) **On the alkaloid cell and contained alkaloids of *Dicentra spectabilis* (Papaveraceae).** *Shoyakugaku Zasshi*, v. 46(2): p. 109-114, 1992 (9 ref, Eng, Jap).

The alkaloid cells and intracellular components of these alkaloid cells were analysed by HPLC and were found to contain protopine and palmitine. The alkaloids of rhizomes of *D. spectabilis* were also analysed by general

extraction and separation procedure. Tertiary alkaloids protopine and quaternary alkaloid sanguinarine chloride, choline chloride, (-)-cis-N-methylstylopinium chloride and (-)-magnocurarine chloride were isolated. One new quaternary alkaloid was isolated which was determined as (-)-cis-N-methylcheilanthesifolium chloride.

9301-0370 King, J.R., Knight, R.J. (Subtropical Horticultural Research Station, Agricultural Research Service, US Department of Agriculture, Miami, Florida 33158 1399, USA) **Volatile components of the leaves of various avocado cultivars.** *Journal of Agricultural and Food Chemistry*, v. 40(7): p. 1182-1185, 1992 (11 ref, Eng).

The essential oils from the steam distillation of the leaves of avocados of three racial lineages were assayed by use of capillary column gas-liquid chromatography and mass spectroscopy. Estragole and two unidentified peaks were present only in the leaves of the five Mexican race avocados. The areas of the 54 major peaks in the 15 cultivars studied were subjected to principal component analysis, and the patterns of the three major factors were plotted. In all plots the members of the Mexican race were well separated into tight clusters but members of the Guatemalan and West Indian races formed loose, overlapping clusters. Previously unreported constituents of avocado leaves identified in this study were alpha-phellandrene, gamma-terpinene, D-limonene, D-carvone, and cis-3-hexen-1-ol.

9301-0371 Kitanov, G.M., Dam the Van, Assenov, I. (Department of Pharmacognosy, Faculty of Pharmacy, Institute of Pharmacy and Pharmacology, Dunav Street 2, 1000 Sofia, Bulgaria) **Flavonols from Melaleuca leucadendron leaves.** *Fitoterapia*, v. 63(4): p. 379-380, 1992 (5 ref, Eng).

Isolation of kaempferol, quercetin, myricetin, myricitrin, quercitrin, miquelianin and quercetin-3-O-xyloglucoside from dried leaves of *M. leucadendron* is reported.

9301-0372 Ko, S.R., Kim, S.C., Choi, K.J. (Korean Ginseng and Tobacco Research Institute, Taejeon 305-345, Korea) **Extract yields and saponin contents of red ginseng extracts prepared with various concentrations of ethanol.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 24-28, 1992 (15 ref, Eng, Kor).

Red ginseng (*Panax ginseng*) extracts were prepared with various concentrations of ethanol and saponins were identified and determined by TLC and HPLC. Yields of extracts, 19.7 to 50.3 percent, were the highest in water extract and showed significant decrease with the increase of ethanol concentration used for extraction. Saponin yields from red ginseng were conspicuously increased with the

increase in ethanol concentration and were 3.47 to 5.3 percent of crude saponins and 1.28/93 percent of six major ginsenosides. Saponin contents in the red ginseng extracts were 6.9-24.2 percent of crude saponin and 2.57-9.22 percent of six major ginsenosides.

9301-0373 Konda, Y., Toda, Y., Harigaya, Y., Lou, H., Li, X., Onda, M. (School of Pharmaceutical Sciences, Kitasato University, Minato-ku, Tokyo 108, Japan) **Two new glycosides, hancoside and neohancoside A, from Cynanchum hancockianum.** *Journal of Natural Products*, v. 55(10): p. 1447-1453, 1992 (10 ref, Eng).

Two new glycosides, hancoside and neohancoside A have been isolated from *C. hancockianum* along with five known compounds, antofine, cynatratoside A, daucosterol, (-)-leucanthevit, and sinapic acid. Structures of hancoside and neohancoside A were established as 3beta,14beta,15beta-trihydroxypregn-5-en-20-one 3beta-O-beta-D-(6-O-sinapoyl)-glucopyranosyl-(1-2)-beta-D-glucopyranoside and linalool 3-O-beta-D-xylopyranosyl-(1-6)-beta-D-glucopyranoside by spectroscopic analysis.

9301-0374 Kopp, B., Krenn, L., Kubelka, E., Kubelka, W. (Institute of Pharmacognosy, University of Vienna, Wahringer Strasse 25, A-1090 Vienna, Austria) **Cardenolides from Adonis aestivalis.** *Phytochemistry*, v. 31(9): p. 3195-3198, 1992 (16 ref, Eng).

Four cardenolides were isolated for the first time from the aerial parts of *Adonis aestivalis*. The compounds were identified by spectrometry and for 3-epi-periplogenin, helveticoside also by comparison with authentic substances. Two new cardenolides were structurally elucidated: strophanthidin-3-O-beta-D-digitoxosido-alpha-L-digitoxosido-alpha-L-cymarosido-beta-D-glucoside and strophanthidin-3-O-beta-D-digitoxosido-beta-D-digitoxosido-beta-D-digitoxosido-beta-D-glucoside.

9301-0375 Kostalova, D., Hrochova, V., Suchy, V., Budesinsky, M., Ubik, K. (Department of Pharmacognosy and Botany, Faculty of Pharmacy, Comenius University, Odbojarov 10, 83232 Bratislava, Czechoslovakia) **Two pyrrole acids from Berberis koreana.** *Phytochemistry*, v. 31(10): p. 3669-3670, 1992 (14 ref, Eng).

An extract from leaves of *B. koreana* afforded 1H-pyrrole-2,5-dicarboxylic acid and its monomethyl ester. Their structures were determined by spectroscopic methods.

9301-0376 Krauze-Baranowska, M., Cisowski, W. (Department of Pharmacognosy, School of Medicine, 80-416, Gdansk, ul. Gen. J. Hallera, 107, Poland) **C-Glucosides of apigenin from Bryonia alba L.** *Polish Journal of Chemistry*, v. 66(6): p. 951-957, 1992 (14 ref, Eng).

From the methanolic extracts of *B.alba* three flavonoid C-glucosides viz., 2-(4'-hydroxyphenyl)-5-hydroxy-6-C-glucopyranosyl-7-O-beta-D-glucopyranosyloxy-4H-benzopyran-4-one, 2-(4'-hydroxyphenyl)-5,7-dihydroxy 6-C-glucopyranosyloxy-4H-1-benzopyran-4-one and 2-(4'-hydroxyphenyl)-5,7-dihydroxy-8C-glucopyranosyloxy-4H-1-benzopyran-4-one have been isolated. The compounds were identified by spectroscopic means.

9301-0377 Kren, L., Kopp, B., Griesmayer-Camus, E., Kubelka, W. (Institut für Pharmakognosie der Universität Wien, Wahinger Strasse 25, A-1090 Wien, Austria) **Bufadienolides from *Urginea aphylla* (Forsk.) Speta.** *Scientia Pharmaceutica*, v. 60(1-2): p. 65-72, 1992 (13 ref, Ger, Eng).

Besides the known bufadienolides scillicyanoside, gamabufotalin-3-O-alpha-L-rhamnoside, scilliphaeoside, scilliglucoside, gamabufotalin-3-O-alpha-L-rhamnoside-glucoside, procillaridin A, scilliphaeosidin-3-O-beta-D-glucoside and scillarenin-3-O-beta-D-glucoside three new substances 16beta-O-acetyl-gamabufotalin-3-O-alpha-L-rhamnoside, 12beta-hydroxy-scilliroside and 5alpha-4,5-dihydroscillirosidin-3-O-alpha-L-thevetoside-beta-D-glucoside have been isolated from the bulbs of tetraploid *U.aphylla* and characterized.

9301-0378 Kurobayashi, Y., Sakakibara, H., Yanai, T., Yajima, I., Hyashi, K. (Kawasaki Research Centre, T. Hasegawa Company Limited, 335, Kariyade, NaKa-haraku, Kawasaki 211, Japan) **Volatile flavour compounds of *Myoga* *Zingiber Mioga*.** *Agricultural and Biological Chemistry*, v. 55(6): p. 1655-1657, 1991 (4 ref, Eng).

GC and MS analysis of volatile compounds of *Z.mioga* yielded beta-phellandrene, beta-elemene and beta-pinene as major compounds. The oxygenated volatile compounds include (Z)-3-hexenol, linalool, pinocarveol, pentadecanal and indole. The first three compounds, are considered to contribute to earthy green aroma of mioga.

9301-0379 Lavaud, C., Massiot, G., Le Men-Olivier, L., Viari, A., Vigny, P., Delaude, C. (Faculté de Pharmacie (URA au CNRS no 492), 51 rue Cognacq-Jay, 51096 Reims Cedex, France) **Saponins from *Steganotaenia araliacea*.** *Phytochemistry*, v. 31(9): p. 3177-3181, 1992 (8 ref,

Six saponins have been isolated and identified from the leaves of *S.araliacea*. The structures of the saponins were established by analysis of their ¹H and ¹³C NMR spectra with the help of 2D-experiments and by Californium Plasma Desorption Mass spectrometry.

9301-0380 Lawrence, B.M. (RJR Tobacco Company, Bowman Gray Technical Center, PO Box 2959, Winston-Salem, NC 27102, USA) **Progress in essential oils.** *Perfumer & Flavorist*, v. 17(5): p. 131-146, 1992 (47 ref, Eng).

Recent developments made in the chemistry of essential oils of *Tagetes minuta*, *Citrus spp*, *Myristica fragrans* and *Anthemis nobilis* have been reviewed.

9301-0381 Lee, H.S., Han, D.S. (College of Pharmacy, Seoul National University, Seoul 151 742, Korea) **A new acylated n-glycosyl lactam from *Aristolochia contorta*.** *Journal of Natural Products*, v. 55(9): p. 1165-1169, 1992 (14 ref, Eng).

A new acylated glycoside isolated from the roots of *A.contorta* has been characterized as aristolactam N-(6'-trans-p-coumaroyl)-beta-D-glucopyranoside {2}. Aristolactam-N-beta-D-glucopyranoside was also isolated from the same source. Compound 2 showed relatively significant antibacterial activity against gram-positive bacteria, based on disc diffusion and dilution methods.

9301-0382 Leitaó, G.G., Kaplan, M.A.C., Galeffi, C. (Núcleo de Pesquisas de Produtos Naturais, Universidade Federal do Rio de Janeiro, Ilha da Cidade Universitária, 21941, Brazil) **Epi-populifolic acid from *Aristolochia cymbifera*.** *Phytochemistry*, v. 31(9): p. 3277-3279, 1992 (11 ref, Eng).

The structure of a new clerodane diterpene, the C-5 epimer of populifolic acid, isolated from the roots of *A.cymbifera* was determined by spectroscopic data. From the same plant, 2-oxo-populifolic acid, kolavelool, (-)-cubebib, (-)-hinokinin, fargesin, magnoflorine and allantoin were isolated.

9301-0383 Lewis, J.R. (Department of Chemistry, University of Aberdeen, Meston Walk, Old Aberdeen AB 92 UE) **Muscarine, oxazole, thiazole imidazole and peptide alkaloids and other.** *Natural Product Reports*, v. 9(1): p. 81-101, 1992 (150 ref, Eng).

Present article reviews the literature published between July 1989 and June 1990, on various plant originated muscarine, oxazole thiazole and imidazole alkaloids along with information on biosynthesis and biological activity of some alkaloids. Information on miscellaneous alkaloids like blepharin from *Blepharis edulis* capillarison from *Artemisia capillaris*, aristolactam piperolactam from *Piper bochimerifolicum* etc. is also reviewed.

9301-0384 Li, X.C., Yang, C.R.*, Ichikawa, M., Matsuura, H., Kasai, R., Yamasaki, K. (Laboratory of Phytochemistry, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650 204, Yunnan, China) **Steroid saponins**

from *Polygonatum kingianum*. *Phytochemistry*, v. 31(10): p. 3559-3563, 1992 (21 ref, Eng).

Four new steroid saponins, kingianosides A-D, were isolated from the rhizome of *P. kingianum*, together with two known steroid saponins. On the basis of chemical and spectral evidence, the structures of kingianosides A-D were established as gentrogenin 3-O-beta-D-glucopyranosyl(1-4)-beta-D-galactopyranoside, gentrogenin 3-O-beta-D-glucopyranosyl(1-4)-beta-D-fucopyranoside, 26-O-beta-D-glucopyranosyl-22-hydroxy-25(R)-furost-5-en-12-on-3beta,22 -diol 3-O-beta-D-glucopyranosyl(1-4)-beta-D-galactopyranoside and 26-O-beta-D-glucopyranosyl-22-hydroxy-25(R)-furost-5-en-12-on-3beta,22 -diol 3-O-beta-D-glucopyranosyl(1-4)-beta-D-fucopyranoside, respectively.

9301-0385 Looman, A., Svendsen, A.B. (Division of Pharmacognosy, State University of Leiden, Gorlaeus Laboratories, P O Box 9502, 2300 R A Leiden, The Netherlands) **The needle essential oil of Norwegian mountain juniper, *Juniperus communis* L. var. *saxatilis* Pall..** *Flavour and Fragrance Journal*, v. 7(1): p. 23-25, 1992 (2 ref, Eng).

The needle essential oil of Norwegian mountain juniper, (*J. communis* var. *saxatilis*, was investigated by headspace capillary gas chromatography. The average ratio of alpha-pinene: sabinene: limonene was found to be 21:45:5 (n=25). However, at two rather cold and weather-beaten habitats some shrubs were found with quite different ratios of these compounds, viz., 42:24:7 (n=1) and 51: :24 (n=5), and 82: :4 (n=2) and 53:20:2 (n=3), respectively.

9301-0386 Lou, F.C., Wu, M.Y., Sun, H.Z., Chen, Y.Z., Xu, B.J. (China Pharmaceutical University, Nanjing 210009, China) **A sesquiterpene lactone of grand-cycle carbon skeleton structure VI. Determination of chemical structure of neo-aristolactone.** *Acta Pharmaceutica Sinica*, v. 27(1): p. 37-41, 1992 (4 ref, Chi, Eng).

Structure of neo-aristolactone, a sesquiterpene isolated from the radix of *Aristolochia mollissima* has been elucidated on the basis of spectral data and X-ray crystallography.

9301-0387 Luo, Y.H., Nie, R.L. (Laboratory of Phytochemistry, Kunming Institute of Botany, Academia Sinica, Kunming 650 204, China) **Studies on iridoid glycosides from *Swertia angustifolia*.** *Acta Pharmaceutica Sinica*, v. 27(2): p. 125-129, 1992 (10 ref, Chi, Eng).

Five secoiridoid glycosides were isolated from *S. angustifolia*. The structure of the new compounds, angustiamarin and angustioside with three known com-

pounds sweroside, swertiamarin and epi-eustomoside were elucidated by means of spectroscopic and chemical methods.

9301-0388 Machida, K., Kikuchi, M. (Tohoku College of Pharmacy, 4-1, Komatsushima 4-chome, Aobaku, Sendai, Miyagi 981, Japan) **Phenolic compounds from *Viburnum dilatatum*.** *Phytochemistry*, v. 31(10): p. 3654-3656, 1992 (12 ref, Eng).

Three new phenolic compounds have been isolated from the leaves of *V. dilatatum* and their structures elucidated as 1-(4'-hydroxy-3'-methoxyphenyl)-2-2"-hydroxy-4"-(3'''-hydroxypropyl)-1,3-propanediol 1-O-beta-D-glucopyranoside (erythro isomer), neochlorogenic acid methyl ester and cryptochlorogenic acid methyl ester by spectroscopic studies.

9301-0389 Macleod, G., Forcen, M. (Department of Food Science, King's College London, Campden Hill Road, London W8 7AH, UK) **Analysis of volatile components derived from the carob bean *Ceratonia siliqua*.** *Phytochemistry*, v. 31(9): p. 3113-3119, 1992 (35 ref, Eng).

Volatile components of carob beans were analysed using established procedures. In all, 169 components (ca 97.4 percent of the total isolate) were positively identified, of which 163 are reported as carob bean volatiles for the first time. A further eight components (ca 0.5 percent) were partially characterized. Seven aliphatic acids represented an extraordinarily high level (77.5 percent) of the isolate, the major contributors being methylpropanoic acid (45.0 percent) and hexanoic acid (19.0 percent). The non-acid volatiles contained 25 aliphatic esters (10.52 percent).

9301-0390 Majidayatollahi, S.A., Ahmed, Z., Malik, A., Afza, N., Badar, Y. (H.E.J. Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **A hopane type triterpene from *Sericostoma pauciflorum*.** *Fitoterapia*, v. 63(4): p. 304-307, 1992 (12 ref, Eng).

Apart from beta-sitosterol, a new pentacyclic triterpene of the hopane series, provisionally named as pauciflorinyl acetate has been isolated from *S. pauciflorum* and its structure has been elucidated as hopan-24-ol-20 beta-yl acetate on the basis of chemical spectroscopic studies.

9301-0391 Majumder, P.L., Pal, S. (Department of Chemistry, University College of Science, 92, Acharya Prafulla Chandra Road, Calcutta 700 009, WB, India) **Rotundatin, a new 9,10-dihydrophenanthrene derivative from *Dendrobium rotundatum*.** *Phytochemistry*, v. 31(9): p. 3225-3228, 1992 (12 ref, Eng).

Rotundatin, a new 9,10-dihydrophenanthrene derivative was isolated from the orchid, *D.rotundatum*, which also afforded the known stilbenoids 2,7-dihydroxy-3,4,6-trimethoxyphenanthrene, 2,7-dihydroxy-3, 4, 6-trimethoxy-9,10-dihydrophenanthrene, nudol, moscatin and batatasin-III. Rotundatin was shown to be 2,5,9-trihydroxy-4-methoxy-9,10-dihydrophenanthrene from spectral and chemical evidence.

9301-0392 Marco, J.A., Sanz, J.F., Sancenon, F., Susanna, A., Rustaiyan, A., Saberi, M.(Departamento de Quimica Organica, Facultad de Ciencias Quimicas, Universidad de Valencia, E-46100 Burjassot, Valencia, Spain) **Sesquiterpene lactones and lignans from Centaurea species.** *Phytochemistry*, v. 31(10): p. 3527-3530, 1992 (21 ref, Eng).

The aerial parts of *C.calcitrapa* yielded cnicin, 4'-acetate, melitensin, a related elemanolide, the two new germacranbolides 11alpha,13- and 11beta,13-dihydrosalonitenolide, and the lignans arctigenin, pinoresinol and 7'(S)-hydroxyarctigenin. The latter compound is described for the first time as a natural product. The aerial parts of *C.pabotii* yielded 11,13-dihydrodeacylcynaropicrin, aguerin A and a new guaianolide related to cynaropicrin.

9301-0393 Marner, F.J., Horper, W.(Institute fur Biochemie der Universitat zu Koln, Zulpicher Str., 47, D-5000 Koln 1, Germany) **Phenols and quinones from seeds of different Iris species.** *Helvetica Chimica Acta*, v. 75(5): p. 1557-1562, 1992 (10 ref, Eng).

The seed oils of *I.pseudacorus*, *I.sibirica* and *I.missouriensis* have been found to contain appreciable amounts of phenols, quinones, and resorcinols, substituted with homologous alkyl or alkenyl side chains. Structures of these compounds have been elucidated and their possible biosynthesis discussed.

9301-0394 Massiot, G., Lavaud, C., Benkhaled, M., Le Men-Olivier, L.(Laboratoire de Pharmacognosie associe au CNRS, Universite de Reims Champagne Ardenne, Faculte de Pharmacie, 51. rue Cognacq-Jay, 51096 Reims Cedex, France) **Soyasaponin VI, a new maltol conjugate from alfalfa and soybean.** *Journal of Natural Products*, v. 55(9): p. 1339-1342, 1992 (7 ref, Eng).

Soyasaponin VI, a new O-22 maltol conjugate of soyasaponin I, has been isolated from alfalfa (*Medicago sativa*) seeds and soybean (*Glycine max*). It is a labile compound and a possible precursor of soyasaponin I.

9301-0395 Massiot, G., Xiang-Fei Chen, Lavaud, C., Le Men-Olivier, L., Delaude, C., Viari, A., Vigny, P., Duval,

J.(Laboratoire de Pharmacognosie, URA CNRS 492, Faculte de Pharmacie, 51 rue Cognacq-Jay, 51096 Reims Cedex, France) **Saponins from stem bark of Petersianthus macrocarpus.** *Phytochemistry*, v. 31(10): p. 3571-3576, 1992 (16 ref, Eng).

Two bioactive saponins were isolated from the stem bark of *P.macrocarpus* and their structures elucidated by chemical degradations and by a combination of 2D NMR techniques and by Californium plasma desorption mass spectrometry. 3,3'-Dimethoxy ellagic acid and 3,3'-dimethoxy-4-O-beta-D-glucopyranosyl ellagic acid were also isolated.

9301-0396 Masterova, J., Granciarova, Z.(Katedra farmakognozie a botaniky Farmaceutickej fakulty Univerzity Komenskeho, Bratislava) **Phytochemical review of the constituents in Calendula officinalis L. and their therapeutic evaluation.** *Ceskoslovenska Farmacie*, v. 41(4-5): p. 173-176, 1992 (67 ref, Cze, Eng).

Only title translated.

9301-0397 Masuda, T., Isobe, J., Jitoe, A., Nakatani, N.(Laboratory of Food Chemistry, Faculty of Science of Living, Osaka City University, Sumiyoshi, Osaka 558, Japan) **Antioxidative curcuminoids from rhizomes of Curcuma xanthorrhiza.** *Phytochemistry*, v. 31(10): p. 3645-3647, 1992 (8 ref, Eng).

A new curcumin analogue has been isolated from the rhizomes of *C.xanthorrhiza* along with four known curcuminoids, and its structure has been determined as 1-(4-hydroxy-3,5-dimethoxyphenyl)-7-(4-hydroxy-3-methoxyphenyl)-(1E,6E)-1,6-heptadiene-3,4-dione by spectral data. The new compound showed potent antioxidant activity against autoxidation of linoleic acid in a water-alcohol system.

9301-0398 Mata, R., Camacho, M.D.R., Mendoza, S., Cruz, M.D.C. (Laboratorio de Fitoquimica, Departamento de Farmacia, Facultad de Quimica, Universidad Nacional Autonoma de Mexico, Coyoacan 04510 Mexico, D.F. Mexico) **A phenylstyrene from Hintonia latiflora.** *Phytochemistry*, v. 31(9): p. 3199-3201, 1992 (5 ref, Eng).

A novel phenylstyrene, 6-O-beta-D-glucopyranosyl-2,3'-4'-trihydroxy-4-methoxy-alpha-phenylstyrene, and a new 4-phenylcoumarin, 5-O-(6"-acetyl-beta-D-glucopyranosyl)-7,3'-4'-trihydroxy-4-phenylcoumarin, were isolated from the stem bark of *H.latiflora* known as 'Copalchi' in Mexico. The Proposed structures are based on spectroscopic and chemical grounds.

9301-0399 Mazza, G., Ciaravolo, S., Chiricosta, G., Celli, S.(SME Ricerche, Parco Scientifico Agro Biotecnologico

81015 Piana di Monte Verna (CE), Italy) **Volatile flavour components from ripening and mature garlic bulbs.** *Flavour and Fragrance Journal*, v. 7(3): p. 111-116, 1992 (15 ref, Eng).

The volatile components of crushed fresh garlic (*Allium sativum*) of Mediterranean origin were analysed. 53 volatile compounds were detected and 22 of them were identified in methanolic and water extracts. Three new sulphur compounds, methyl-(Z)-prop-1-enyl disulphide, allyl (Z)-prop-1-enyl disulphide and allyl (E)-prop-1-enyl disulphide, were tentatively identified for the first time as components of garlic. Differences between fresh garlic bulbets in an early stage of development and fully mature garlic bulbs have been pointed out. The main sulphur compounds in both methanolic and water extracts were found to be diallyl disulphide, 3-vinyl-4H-1,2-dithiin, 2-vinyl-4H-1,3-dithiin, allyl (E)-prop-1-enyl disulphide, allyl methyl disulphide, allyl methyl trisulphide and diallyl trisulphide. The methanolic extract, in comparison with the water extract, showed higher amounts of two important compounds, 3-vinyl-4H-1,2-dithiin and 2-vinyl-4H-1,3-dithiin, which exhibit antithrombotic activity.

9301-0400 Mead, E.W., Looker, M., Gardner, D.R., Stermitz, F.R. (Department of Chemistry, Colorado State University, Fort Collins, CO 80523, USA) **Pyrrolizidine alkaloids of *Liatris punctata* and its root parasite, *Castilleja integra*.** *Phytochemistry*, v. 31(9): p. 3255-3257, 1992 (20 ref, Eng).

Pyrrolizidine alkaloids were found in the parasitic plant *C.integra* and these were traced to the root host plant *l.punctata*. In addition to known alkaloids, a new pyrrolizidine alkaloids, punctanecine, was found and shown to be 7-angelyl-9-iridiflorylhastanecine.

9301-0401 Mebe, P.P., Makuhunga, P. (Department of Chemistry, University of Zimbabwe, Box MP 167, Harare, Zimbabwe) **11-(E)-p-Coumaric acid ester of bergenin from *Peltophorum africanum*.** *Phytochemistry*, v. 31(9): p. 3286-3287, 1992 (11 ref, Eng).

An ethanol extract of the bark of *P.africanum* (black wattle) yielded a new compound, 11-O-(E)-p-coumaroyl-bergenin and two known compounds, bergenin and norbergenin. The structures of these compounds have been determined through chemical and spectroscopic studies.

9301-0402 Medici, D.D., Pieretti, S., Salvatore, G.*, Nicoletti, M., Rasoanaivo, P. (Istituto Superiore di Sanita, Viale Regina Elena 299, 00161, Italy) **Chemical analysis of essential oils of Malagasy medicinal plants by gas chromatography and NMR spectroscopy.** *Flavour and Fragrance Journal*, v. 7(5): p. 275-281, 1992 (8 ref, Eng).

The composition of the essential oils of medicinal plants indigenous to or cultivated in Madagascar was determined. Analyses were performed coupling the data obtained by capillary gas chromatography and ¹H- and ¹³C-NMR techniques. The ¹³C-NMR spectroscopy proved to be an important tool, which can be very useful in the identification of main constituents, whereas only partial indications can be obtained for minor components. The results of the analyses of the essential oils of commercial plants *Cinnamomum camphora*, *C. zeylanicum*, *Eucalyptus citriodora*, *E.globulus*, *Eucalyptus spp.*, *Melaleuca viridiflora*, *Ocimum gratissimum* and endemic species (i.e., *Helichrysum gymnocephalum*, *Priadia goyavia*, *Ravensara anisata* are reported. Some antibacterial activities against *Escherichia coli* of the essential oils are also reported.

9301-0403 Menon, A.N., Narayanan, C.S. (Division of Food, Regional Research Laboratory, (CSIR), Trivandrum 695 019, Kerala, India) **Glycosidically bound volatiles of clove *Syzygium aromaticum*(L.) Merr. et Perry (Myrtaceae).** *Flavour and Fragrance Journal*, v. 7(3): p. 155-157, 1992 (9 ref, Eng).

Bound volatiles of dried clove buds and fresh green clove leaves were studied by Svendsen's method, using both beta-glucosidase and alpha-amylglucosidase for enzyme hydrolysis. Apart from aliphatic alcohols and monoterpene alcohols, eugenol, isoeugenol, farnesol and nerolidol were identified as aglycones.

9301-0404 Menut, C., Bessiere, J.M., Lamaty, G., Zollo, P.H.A., Fekam, F.B., Chalchat, J.C., Garry, R.P. (Universite de Montpellier 11, 34095 Montpellier Cedex 5, France) **Aromatic plants of tropical Central Africa. Part VII. A comparative study of the volatile constituents of the stem bark of *Enantia chlorantha* Oliv. and *Xylopia staudtii* Engl. & Diels from Cameroon.** *Flavour and Fragrance Journal*, v. 7(5): p. 259-261, 1992 (15 ref, Eng).

Hydrodistillation of the stem bark of *E.chlorantha* and of *X.staudtii* from Cameroon gave yellowish coloured oils in 0.2 percent yield. The composition of the essential oils was determined by mean of capillary gas chromatography and mass spectrometry. The volatile oils from the two species were found to be similar and very complex. Oxygenated sesquiterpenes constituted more than 70 percent of the two samples, among which three epoxides (1,5-epoxysalvial-4(14)-ene, beta-caryophyllene epoxide, humulene epoxide), spathulenol and alpha-cadinol were the most prominent.

9301-0405 Merritt, A.T., Ley, S.V. (Glaxo Group Research Ltd.; Greenford, Middle Sex, UB6 0HE) **Clerodane diterpenoids.** *Natural Product Reports*, v. 9(3): p. 243-287, 1992 (430 ref, Eng).

The literature on the isolation, structural elucidation and reported biological activities of large number of clerodanes has been reviewed. The families of plants covered are Annonaceae, Aristolochiaceae, Menispermaceae, Portulacaceae, Flacourtiaceae, Cistaceae, Cucurbitaceae, Caesalpinaceae, Leguminosae, Mimosaceae, Euphorbiaceae, Rutaceae, Sapindaceae, Verbenaceae, Labiatae, Scrophulariaceae, Compositae, Alismaceae, Orchidaceae, Araucariaceae.

9301-0406 Metwally, M.A., Abdel-Mogib, M. (Department of Chemistry, Faculty of Science, University of Mansoura, Mansoura, Egypt) **Chemical constituents of *Solidago petradoria*.** *Pakistan Journal of Scientific and Industrial Research*, v. 35(3): p. 88-89, 1992 (21 ref, Eng).

Air dried aerial parts of the plant on extraction with light petroleum-ether-methanol (1:3:1) on fractionation and chromatography afforded three labdane derivatives while the roots on similar treatment afforded beta farnesene and 3-angeloxy germacrene D, as well as two labdane derivatives.

9301-0407 Michael, J.P. (Centre for Molecular Design Department of Chemistry, University of the Witwatersrand, Wits 2050) **Quinoline, quinoxaline and acridone alkaloids.** *Natural Product Reports*, v. 9(1): p. 25-35, 1992 (57 ref, Eng).

Present review covers the literature appeared between July 1989 and June 1990, on the occurrence, isolation, structure, biological activities and biosynthesis of quinoline alkaloids, sesquiterpenoid quinoline alkaloids, acridone alkaloids.

9301-0408 Miyazawa, M., Kasahara, H., Kameoka, H. (Department of Applied Chemistry, Faculty of Science and Engineering, Kinki University, Kowakae, Higashiosaka-shi, Osaka 577, Japan) **Phenolic lignans from flower buds of *Magnolia fargesii*.** *Phytochemistry*, v. 31(10): p. 3666-3668, 1992 (8 ref, Eng).

Three phenolic lignans were isolated from buds of *M. fargesii*. One was a new lignan named (+)-de-O-methylmagnolin and the other two were the newly found lignans from this plant, (+)-phillygenin and (+)-pinoresinol. The structures of these lignans were determined by spectroscopic studies. The structure of (+)-magnolin isolated from this plant was also investigated in detail by spectral data.

9301-0409 Nagaiah, K., David Krupadanam, G.L., Srimanarayana, G. (Department of Chemistry, Osmania University, Hyderabad 500 007, AP, India) **Coumarins from the bark of *Xeromphis uliginosa*.** *Fitoterapia*, v. 63(4): p. 378-379, 1992 (7 ref, Eng).

Isolation of 7-O-(beta-D-apiofuranosyl (1-6) beta-D-glucopyranosyl)-6-methoxy coumarin and scopoletin from the dried bark of *X. uliginosa* is reported. 7-O-(beta-D-apiofuranosyl (1-6) beta-D-glucopyranosyl)-6-methoxy coumarin exhibited antifeedant activity on *Spodoptera litura* 4th instar.

9301-0410 Nagao, T., Okabe, H. (Faculty of Pharmaceutical Sciences, Fukuoka University, Nanakuma 8 19 1, Jonan-ku, Fukuoka 814 01, Japan) **Studies on the constituents of *Aster scaber* Thunb. III. Structures of scaberosides B7, B8 and B9, minor oleanolic acid glycosides isolated from the root.** *Chemical and Pharmaceutical Bulletin*, v. 40(4): p. 886-888, 1992 (5 ref, Eng).

Three new oleanolic acid 3,28-O-bisdesmosides, scaberosides B7, B8 and B9, were isolated as minor saponins from the root of *A. scaber*, and their structures were determined based on spectral and chemical evidence as follows. Scaberoside B7 is 3-O-beta-D-glucopyranosyluronic acid oleanolic acid 28-{O-beta-D-apiofuranosyl-(1-3)-{O-beta-D-xylopyranosyl-(1-4)}}-O-alpha-L-rhamnopyranosyl-(1-2)-alpha-L-arabinopyranosyl} ester, scaberoside B8, 3-O-beta-D-glucopyranosyl oleanolic acid 28-{O-beta-D-xylopyranosyl-(1-4)-O-alpha-L-rhamnopyranosyl-(1-2)-alpha-L-arabinopyranosyl} ester, and scaberoside B9, 3-O-beta-D-glucopyranosyluronic acid oleanolic acid 28-{O-alpha-L-rhamnopyranosyl-(1-2)-{O-beta-D-xylopyranosyl-(1-6)}}-beta-D-glucopyranosyl} ester. Scaberosides B7 and B9 were obtained as their methyl esters.

9301-0411 Nair, A.G.R., Thirupurasundari, G. (Department of Chemistry, Pondicherry University, Pondicherry 605014, India) **Coumarins and flavonoids from *Cuscuta reflexa* parasitic on *Bougainvillea spectabilis*.** *Fitoterapia*, v. 63(4): p. 381-382, 1991 (8 ref, Eng).

Isolation of 6,7-dimethoxycoumarin (Scoparone), 6-hydroxy-7-methoxy-4-(4-hydroxyphenyl)-coumarin (melanettin), quercetin and hyperoside from fresh whole plant of *C. reflexa* is reported.

9301-0412 Nigam, S.K., Xing-Cong, L., De-Zu, W., Mishra, G., Chong-Ren, Y. (National Botanical Research Institute, Lucknow 226001, UP, India) **Triterpenoid saponins from *Madhuca butyracea*.** *Phytochemistry*, v. 31(9): p. 3169-3172, 1992 (12 ref, Eng).

Two new triterpenoidal saponins, butyrosides A and B, were isolated from the seeds of *M. butyracea*, along with two known saponins, Mi-saponin A and 16 alpha-hydroxy Mi-saponin A. On the basis A. On the basis of chemical and spectroscopic evidence, the structures of butyrosides A and

B were established to be 3-O-beta-D-glucopyranosyl protobasic acid 28-O-beta-D-apiofuranosyl (1-3)-beta-D-xylopyranosyl (-4)-alpha-L-rhamnopyranosyl (1-2)-alpha-arabinopyranoside and 3-O-beta-D-glucopyranosyl 16alpha-hydroxy protobasic acid 28-O-beta-D-apiofuranosyl (1-3)-beta-xylopyranosyl (1-4) - alpha-L-rhamnopyranosyl (1-2)-alpha-L-arabinopyranoside, respectively.

9301-0413 Nishiya, K., Kimura, T., Takeya, K., Itokawa, H. (Nippon Hoechst Co., 1-3-2, Minamidai, Kawagoe, Saitama 350, Japan) **Sesquiterpenoids and iridoid glycosides from *Valeriana fauriei*.** *Phytochemistry*, v. 31(10): p. 3511-3514, 1992 (9 ref, Eng).

A new guaiane sesquiterpenoid glycoside together with known sesquiterpenoids and iridoid glycosides have been isolated from the rhizomes and roots of *V. fauriei*. The ¹³C NMR assignments of the isolated compounds are presented.

9301-0414 Noro, Y., Hisata, Y., Kawamura, T., Tanaka, T., Nishibe, S. (Faculty of Pharmacy, Meijo University, 150, Yagotoyama, Tenpaku, Nagoya 468, Japan) **Phenylethanoid glycosides in the leaves of *Forsythia* spp..** *Shoyakugaku Zasshi*, v. 46(3): p. 254-256, 1992 (5 ref, Eng).

The leaves of *Forsythia* spp. contain four phenylethanoid glycosides, i.e. forsythiaside, suspensaside, acteoside and beta-hydroxyacteoside. These glycoside contents of the leaves of eight *Forsythia* spp. were determined by HPLC. According to the results, these 8 species were divided into two groups, i.e. the first group consisting of *F. suspensa*, *F. europaea*, *F. koreana* and *F. intermedia* mainly containing forsythiaside and the second one consisting of *F. viridissima*, *F. japonica*, *F. ovata* and *F. geraldiana* mainly containing acteoside. The phenylethanoid contents in the leaves of the first group varied considerably among the species. The leaves of the second group contained neither forsythiaside nor suspensaside, and the distribution of these phenylethanoids in the leaves among these species was analogous to those in the fruits.

9301-0415 Ogawa, K., Sashida, Y. (Tokyo College of Pharmacy, 1432-1 Horinouchi, Hachioji, Tokyo 192-03, Japan) **Caffeoyl derivatives of a sugar lactone and its hydroxy acid from the leaves of *Bindens pilosa*.** *Phytochemistry*, v. 31(10): p. 3657-3658, 1992 (6 ref, Eng).

A new sugar lactone derivative, 3-O-caffeoyl-2-C-methyl-D-erythrono-1,4-lactone, and three new hydroxy acid derivatives, 2-O-caffeoyl-2-C-methyl-D-erythronic acid, methyl 2-O-caffeoyl-2-C-methyl-D-erythronic acid, and methyl 3-O-caffeoyl-2-C-methyl-D-erythronic acid

were isolated from the leaves of *B. pilosa*. Their structures were elucidated on the basis of chemical and spectral evidence, two methyl esters are thought to be artefacts.

9301-0416 Omata, A., Nakamura, S., Hashimoto, S., Furukawa, K. (Shiseido Product Research Laboratories, 1050 Nippa-cho, Kohoku-ku, Yokohama-shi, Kanagawa 223, Japan) **Volatile components of *Plumeria* flowers. Part 2.1 *Plumeria rubra* L. cv. 'Irma Bryan'.** *Flavour and Fragrance Journal*, v. 7(1): p. 33-35, 1992 (3 ref, Eng).

The essential oil of one of the cultivars of *P. rubra* 'Irma Bryan' growing in Hawaii was extracted by simultaneous distillation and extraction. The essential oil was analysed with GC and GC-MS, and a total of 67 compounds were identified. Beta-phenylethyl alcohol, phenylacetaldehyde and methyl cinnamate were found to make a major contribution to the floral spicy scent of this flower.

9301-0417 Onwukaeme, N.D., Rowan, M.G.* (The School of Pharmacy and Pharmacology, University of Bath, Claverton Down, Bath BA2 7AY, U.K) **Jatrophone and lathyrane diterpenoid esters from North American leafy spurge seed.** *Phytochemistry*, v. 31(10): p. 3479-3482, 1992 (23 ref, Eng).

A known lathyrane ester and a new jatrophone ester have been isolated from seeds of two different stands of *Euphorbia esula* (North American leafy spurge), an introduced *Euphorbia* of uncertain taxonomic status. A partial structure of the jatrophone ester has been elucidated by spectroscopic means.

9301-0418 Ori, K., Mimaki, Y., Sashida, Y.* , Nikaido, T., Ohmoto, T. (Tokyo College of Pharmacy, 1432-1, Horinouchi, Hachioji, Tokyo 192-03, Japan) **Cerveratrum alkaloids from bulbs of *Fritillaria persica*.** *Phytochemistry*, v. 31(10): p. 3605-3607, 1992 (10 ref, Eng).

Examination of the fresh bulbs of *F. persica* resulted in the isolation of five cerveratrum alkaloids. Their structures were established by spectral analysis and hydrolysis. Four of the alkaloids showed potent inhibitory activity on cyclic AMP phosphodiesterase.

9301-0419 Otsuka, H. (Institute of Pharmaceutical Sciences, Hiroshima University School of Medicine, 1-2-3-Kasumi, Minami-ku, Hiroshima 734, Japan) **Isolation of isolinariins A and B, new flavonoid glycosides from *Linaria japonica*.** *Journal of Natural Products*, v. 55(9): p. 1252-1255, 1992 (4 ref, Eng).

Five flavonoid glycosides were isolated from *L. japonica*. Their structures were determined to be linarin, pectolinarin, linariin (4-O-acetylpectolinarin), and two new

flavonoid glycosides, isolinariin A (2-O-acetylpectolinarin) and isolinariin B (3'''-O-acetylpectolinarin). The compounds were identified using spectroscopic evidence and the results of chemical conversions.

9301-0420 Otsuka, H., Kashima, N., Hayashi, T., Kubo, N., Yamasaki, K., Padolina, W.G. (Department of Pharmacognosy, Institute of Pharmaceutical Sciences, Hiroshima University School of Medicine, 1-2-3 Kasumi, Hiroshima 734, Japan) **Premnaodorosides A, B and C, iridoid glucoside diesters of an acyclic monoterpenediol from leaves of *Premna odorata*.** *Phytochemistry*, v. 31(9): p. 3129-3133, 1992 (19 ref, Eng).

The acyclic monoterpenediol diesters, prenaodorosides A, B and C, isolated from *P. odorata*, were shown to be 3,7-dimethyloctan-1,8-diol esterified with iridoid acid glucosides, namely two mussaenosidic acid moieties, one mussaenosidic moiety and one 8-epiloganic acid moiety, and one mussaenosidic acid moiety and one gardoside moiety. Phenethyl alcohol glycosides, verbascoside, isoacteoside, bioside (decaffeoylverbascoside), and cistanoside F were also isolated.

9301-0421 Pabst, A., Barron, D., Semon, E., Schreier, P. (Lehrstuhl für Lebensmittelchemie, Universität Würzburg, Am Hubland, 8700 Würzburg, Germany) **A 4-hydroxy-beta-ionone disaccharide glycoside from raspberry fruits.** *Phytochemistry*, v. 31(9): p. 3105-3107, 1992 (10 ref, Eng).

From a methanolic extract of raspberry fruits, the 4-O-alpha-L-arabinofuranosyl-(1-6)-beta-D-glucopyranoside of (4S)-4-hydroxy-beta-ionone was isolated by adsorption chromatography on XAD-2, followed by liquid chromatography on Sephadex LH-20, RP-18 and silica gel as well as by reverse-phase HPLC. The structure of the norcarotenoid glycoside was determined by ¹H and ¹³C NMR spectroscopy and DCI- mass spectral analysis. The absolute configuration of the aglycone was established to be (4S).

9301-0422 Pedro, L.G., Pais, M.S.S., Scheffer, J.J.C. (Departamento de Biologia Vegetal, Faculdade de Ciencias de Lisboa, Bloco C-2, Campo Grande, 1700 Lisbon, Portugal) **Composition of the essential oil of *Geranium robertianum* L.** *Flavour and Fragrance Journal*, v. 7(4): p. 223-226, 1992 (7 ref, Eng).

The essential oil from the aerial parts of *G. robertianum* was investigated by GC and GC-MS, which showed that linalol (22.9 percent) was its major component. gamma-Terpinene (13.9 percent), germacrene-D (7.8 percent), limonene (5.3 percent), geraniol (4.4 percent), alpha-terpineol (3.8 percent) and phytol (3.8 percent) were the other

major components of the oil, the composition of which has not been described to date.

9301-0423 Pelletier, S.W., Bhandaru, S., Desai, H.K., Ross, S.A., Sayed, H.M. (Institute for National Products Research and School of Chemical Sciences, The University of Georgia, Athens, Georgia 30602, USA) **Two new norditerpenoid alkaloids from the roots of *Delphinium ajacis*.** *Journal of Natural Products*, v. 55(6): p. 736-743, 1992 (20 ref, Eng).

Two new norditerpenoid alkaloids, ajadelphine, and ajadelphinine, have been isolated from the roots of *D. ajacis*. The structure of ajadelphinine was determined with the aid of ¹H- and ¹³C-NMR spectroscopy, including DEPT, COSY-90, and inverse detected HECTOR (heteronuclear multiple-quantum coherence-HMQC) experiments. Ajadelphine is the first lycoctonine-type norditerpenoid alkaloid having a methoxyl group at C-8 and a hydroxyl group at C-18. Ajadelphinine is the first lycoctonine-type norditerpenoid alkaloid having a C-7-C-8-methylenedioxy group and an 18-OH group. Also isolated were the known norditerpenoid alkaloids delcosine, delsoline, deltaline, gigactonine, 18-methoxygadesine, and delphisine. Delphisine has not been previously reported in this plant.

9301-0424 Pinder, A.R. (Department of Chemistry, University of Central Florida Orlando, Florida 32816, USA) **Azetidine, pyrrole, pyrrolidine, piperidine and pyridine alkaloids.** *Natural Product Reports*, v. 9(5): p. 491-504, 1992 (73 ref,

Reviews literature appeared between July 1990 and June 1991, on various types of alkaloid of plant origin viz., azetidine, pyrrole, pyrrolidine, piperidine, pyridine, azafluorene alkaloids etc..

9301-0425 Pinder, A.R. (Department of Chemistry University of Central Florida, Orlando, Florida 32816, USA) **Pyrrole, pyrrolidine, piperidine, and azepine alkaloids.** *Natural Product Reports*, v. 9(1): p. 17-23, 1992 (40 ref, Eng).

Reviews the literature on pyrrole, alkaloids, pyrrolidine alkaloids, pyridine alkaloids, piperidine and bispiperidine alkaloids and, azepine alkaloids, appeared between July 1989 and June 1990.

9301-0426 Pino, J., Rosado, A., Gonzalez, A. (Research Institute for Food Industry (IIIA) Rancho Boyeres Km 3 1/2, P.O.Box 13400, Havana, Cuba) **Volatile flavour components of garlic essential oil.** *Acta Alimentaria*, v. 20(3-4): p. 163-171, 1991 (15 ref, Eng).

The essential oil of *Allium sativum* was investigated by means of HRGC, GC-MS and by eluate sniffing techni-

ques. Fifteen compounds were identified including the following new ones: (Z) and (E)-2-propenyl 1-propenyl disulfide, 1,2,3-trithi-4-ene and 2-propenyl tetrasulfide. By determination of the flavour dilution (FD) factor, which is proportional to the aroma value, it was found that di(2-propenyl) trisulfide, di (2-propenyl) disulfide and methyl 2-propenyl trisulfide are the most potent flavour compounds in the essential oil. The FD factor was also used for the approximation of odour values of the new compounds.

9301-0427 Quirion, J.C., Husson, H.P., Kan, C., Laprevote, O., Chiaroni, A., Riche, C., Burkard, S., Borschberg, H.J., Bick, I.R.C. (Laboratoire de Chimie Therapeutique, URA 1310 du CNRS, Faculte de Pharmacie, Universite Rene Descartes 4, Avenue de l'Observatoire, 75270, Paris Cedex 06, France) **A revision of the structure of 17-epi-aristotelline and aristolasicone, the first two examples of inverted indole alkaloids.** *Journal of Organic Chemistry*, v. 57(22):p. 5848-5851, 1992 (17 ref, Eng).

Aristolasicone and 17-epi-aristotelline, two alkaloids isolated from *Aristolelia australasica* belong to the same allo series, and are the first reported indole alkaloids from natural sources possessing an inverted indole unit. The structure of aristolasicone was determined by X-ray diffraction. The use of fast atom bombardment ionization combined with tandem mass spectrometry (MS/MS) allowed a distinction between the two series.

9301-0428 Ratnayake, S., Fang, X.P., Anderson, J.E., McLaughlin, J.L., Evert, D.R. (Department of Medicinal Chemistry and Pharmacognosy, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, Indiana 47907, USA) **Bioactive constituents from the twigs of *Asimina parviflora*.** *Journal of Natural Products*, v. 55(10): p. 1462-1467, 1992 (13 ref, Eng).

The EtOH extract of *A. parviflora*, when subjected to activity-directed fractionation using lethality to brine shrimp, led to the isolation and identification of five bioactive compounds: asimicilone (C₁₆H₁₅NO₄; mp 191 degree), which is a new 2-quinolone alkaloid, 6-cis-docosenamide (C₂₂H₄₃NO; mp 42-44 degree), which is a new amide of a long hydrocarbon chain fatty acid, and three known compounds, asimicin, (+)-syringaresinol, and beta-sitosterol-beta-D-glucopyranoside. The structure determination of the new alkaloid was performed by extensive NMR analyses, including HMQC and HMBC. Selective cytotoxic activities of these compounds in three human solid tumor cell lines are also reported.

9301-0429 Reverchon, E., Senatore, F. (Universita di Salerno, Dipartimento di Ingegneria Chimica ed Alimentare, Ponte Don Melillo, I-84081 Fisciano (SA), Italy) **Isolation of rosemary oil: Comparison between hydrodistillation**

and supercritical CO₂ extraction. *Flavour and Fragrance Journal*, v. 7(4): p. 227-230, 1992 (11 ref, Eng).

Rosemary leaf oil was isolated by a supercritical fluid extraction (SFE) procedure coupled to a fractional separation following the extraction stage. The oil produced was compared with rosemary oil isolated by hydrodistillation. Chemical analysis revealed that, although roughly the same compounds were extracted, the two oils possessed a widely different percentage composition. Qualitative aroma testing showed that the oil obtained by SFE using CO₂ showed a fragrance that better resembled that of the rosemary leaves used for the isolation of the oil.

9301-0430 Rios, M.Y., Delgado, G.* (Instituto de Quimica de la Universidad Nacional Autonoma de Mexico, Ciudad Universitaria, Circuito Exterior, Coyoacan 04510, Mexico) **Terpenoids and alkaloids from *Esenbeckia belizensis*. Spontaneous oxidation of furoquinoline alkaloids.** *Journal of Natural Products*, v. 55(9): p. 1307-1309, 1992 (17 ref, Eng).

Several terpenoids and the alkaloids kokusaginine and flindersiamine were isolated from the aerial parts of *Esenbeckia belizensis*. Kokusaginine showed activity in the brine shrimp lethality test. The structures of the main autoxidation products derived from the natural alkaloids were established.

9301-0431 Rios, M.Y., Delgado, G.* (Instituto de Quimica de la Universidad Nacional Autonoma de Mexico, Ciudad Universitaria, Circuito Exterior, Coyoacan 04510, Mexico, D.F) **Polyprenols and acylphloroglucinols from *Esenbeckia nesiotica*.** *Phytochemistry*, v. 31(10): p. 3491-3494, 1992 (33 ref, Eng).

beta-Sitosterol, caryophyllene beta-oxide, friedelin, a mixture of polyprenols, lupeol, clovandiol and a mixture of phloroglucinols are biosynthesized by *E. nesiotica*; 3-geranyl-1(3-methylbutanoyl)-phloroglucinol is a new natural product. This is the first report of the occurrence of polyprenols in the Rutaceae. Polyprenols did not display toxicity in the *Artemia salina* bioassay but the phloroglucinols showed moderate activity.

9301-0432 Rojatkhar, S.R., Nagasampagi, B.A. (National Chemical Laboratory, Pune 411008, Maharashtra, India) **7-Hydroxyeudesmanolides from *Sphaeranthus indicus*.** *Phytochemistry*, v. 31(9): p. 3270-3271, 1992 (9 ref, Eng).

Two new eudesmanolides, along with one known eudesmanolide and two sesquiterpenoids, cryptomeridiol and 4-epicryptomeridiol, have been isolated from *S. indicus*. The structures of the new compounds have been established by spectral methods, and in one case by chemical correlation.

9301-0433 Rustaiyan, A., Sigari, H., Bamoniri, A., Weyerstahl, P. (Department of Chemistry, Shahid Beheshti University, Even, Tehran, Iran) **Constituents of the essential oil of *Zhumeria majdae* Rech. Flavour and Fragrance Journal**, v. 7(5): p. 273-274, 1992 (3 ref, Eng).

The composition of the essential oil from the leaves and flowers of *Z.majdae* growing wild in the south of Iran, was investigated by GC-MS and ¹H-NMR-spectroscopy. Of the thirty components identified, camphor and linalol were found to be the major constituents.

9301-0434 Said, I.M., Din, L.B., Yusoff, N.I., Wright, C.W., Cai, Y., Phillipson, J.D. (Department of Chemistry, University Kebangsaan Malaysia, 43600 UKM Bangi, Malaysia) **A new alkaloid from the roots of *Alstonia angustifolia*. Journal of Natural Products**, v. 55(9): p. 1323-1324, 1992 (10 ref, Eng).

A new alkaloid, 4'-hydroxy-3',5'-dimethoxybenzoylvincamajine(C₃₁H₃₄N₂O₇), was isolated with nine known alkaloids from the roots of *Alstonia angustifolia*.

9301-0435 Sakakibara, I., Ikeya, Y., Hayashi, K., Mitsuhashi, H. (Tsumura Research Institute for Biology & Chemistry, 3586 Yoshiwara, Ami-machi, Inashiki-gun, Ibaraki, 300-11, Japan) **Three phenyldihydronaphthalene lignanamides from fruits of *Cannabis sativa*. Phytochemistry**, v. 31(9): p. 3219-3223, 1992 (9 ref, Eng).

Three new lignanamides, named cannabisin B, C and D, were isolated from the fruits of *C.sativa*. Their structures have been elucidated based on spectral and chemical evidence.

9301-0436 Sakar, M.K., San Feliciano, A. (Department of Pharmacognosy, Faculty of Pharmacy, University of Hacettepe, 06100 Ankara, Turkey) **Diterpenoids of *Juniperus foetidissima* ripe fruits. Fitoterapia**, v. 63(4): p. 327-328, 1992 (9 ref, Eng).

Two major compounds were isolated from the ripe fruits of *J.foetidissima*. One of them was identified as the known trans-communic acid, the other one was the new compound (13S)-abiet-8-(14)-en-13,19-diol.

9301-0437 Sasahara, M., Tamayama, Y., Fujimoto, T., Nishibe, S.*, Tanaka, T. (Faculty of Pharmaceutical Sciences, Higashi Nippon Gakuen University, Ishikari-Tobetsu, Hokkaido 061-02, Japan) **Studies on constituents of plantaginis herba on phenolic and iridoid components of *Plantago hostifolia*. Shoyakugaku Zasshi**, v. 46(3): p. 268-272, 1992 (6 ref, Eng, Jap).

Four phenolic compounds, plantamajoside, isoplan-tamajoside, 3,4-dihydroxyphenethyl alcohol-6-O-caffeoyl-beta-D-glucoside and plantagin, in

addition to aucubin, were isolated from the whole plants of *P.hostifolia* imported from China as Plantaginis Herba. The phenolic and iridoid components of *P.hostifolia* were similar to those of *P.asiatica* the original plant of Plantaginis Herba.

9301-0438 Schuster, A., Stokes, S., Papastergiou, F., Castro, V., Poveda, L., Jakupovic, J. (Institute for Organic Chemistry, Technical University of Berlin, D-1000 Berlin 12, Germany) **Sesquiterpene lactones from two *Tithonia* species. Phytochemistry**, v. 31(9): p. 3139-3141, 1992 (12 ref, Eng).

From two *Tithonia* species, in addition to known compounds, nine new sesquiterpene lactones were isolated: eight germacranolides and one eudesmanolide. The structures were elucidated by means of spectroscopic methods.

9302-0439 Schuster, A., Castro, V., Poveda, L., Papastergiou, F., Jakupovic, J. (Institute for Organic Chemistry, Technical University of Berlin, D-1000 Berlin 12, Germany) **Sesquiterpene lactones from *Koanophyllon albicaule*. Phytochemistry**, v. 31(9): p. 3143-3146, 1992 (12 ref, Eng).

The aerial parts of *K.albicule* afforded 11 new sesquiterpene lactones. In addition, a large amount of germacranolide acid was obtained. The structures of the new compounds were elucidated by high field NMR spectroscopy.

9301-0440 Shaath, N.A., Azzo, N.R., Aal, M.A. (Kato Worldwide Ltd., One Bradford Road, Mount Vernon, NY 10550, USA) **Egyptian jasmine. Perfumer & Flavorist**, v. 17(5): p. 49-55, 1992 (27 ref, Eng).

History, method of extraction of essential oil and absolute, and chemical analysis of *Jasminum grandiflorum* have been reviewed. World production of jasmine in 1990 was estimated at 10.0 to 10.5 metric tons and producing countries are Egypt, India, China, Morocco, Guinea, France and Algeria.

9301-0441 Shaw, P.E., Moshonas, M.G., Baldwin, E.A. (USDA Citrus and Subtropical Products Laboratory, 600 Avenue S, NW (Post Office Box 1909), Winter Haven, FL 33833-1909, USA) **Volatile constituents of *Coccoloba uvifera*. Phytochemistry**, v. 31(10): p. 3495-3497, 1992 (14 ref, Eng).

C.uvifera sea grape pulp was extracted and the extract analysed by gas chromatography-mass spectrometry, resulting in identification of 34 volatile pulp components; these included 20 carboxylic acids, and only two esters and three aldehydes. One volatile component, cyclopentylacetic acid had not been reported earlier as a food component or food

flavouring. Components quantified in sea grape pulp were fructose, glucose, sucrose, and ascorbic acid as well as total acid content.

9301-0442 Shi, Q., Chen, K., Fujioka, T., Kashiwada, Y., Chang, J.J., Kozuka, M., Estes, J.R., McPhail, A.T., McPhail, D.R. (Natural Products Laboratory, Division of Medicinal Chemistry and Natural Products, School of Pharmacy, University of North Carolina, Chapel Hill, North Carolina 27599) **Antitumor agents, 135. 1 Structure and stereochemistry of polacandrin, a new cytotoxic triterpene from *Polanisia dodecandra*.** *Journal of Natural Products*, v. 55(10): p. 1488-1497, 1992 (10 ref, Eng).

The structure of a new dammarane triterpene, polacandrin, isolated from *P. dodecandra* was established as 1 β ,3 α ,12 β ,25-tetrahydroxy-20(S),24(S)-epoxydammarane by chemical and spectroscopic methods. Single-crystal X-ray analysis of polacandrin pentahydrate verified the complete structure and stereochemistry. Polacandrin showed potent cytotoxicities against KB, P-388 and RPMI-7951 tumor cells.

9301-0443 Shin, Soon-Hee, Sim, Y., Kim, Y.S., Chi, Hyung-Joon, Lee, E.B. (College of Pharmacy, Duksung Women's University, Seoul 132 714, Korea) **Studies on essential oils of *Lycopus lucidus* Turcz.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 29-33, 1992 (20 ref, Eng, Kor).

The essential oil of *L. lucidus*, obtained by steam distillation of dried herbs followed by fractionation by column chromatography was analysed by GC-MS. The compounds identified were carvacrol, 2,5-dimethoxy-p-cymene, trans-caryophyllene, spathurenol and trans-beta-farnesene. Two compounds, thymol and caryophyllene were isolated by silica gel column chromatography and analysed TLC, IR, Mass and NMR. And the weak diuretic effect of essential oil and water extract from the dried drugs was observed in rats.

9301-0444 Si, D.Y., Zhao, S.X., Deng, J.Z. (Phytochemistry Division, China Pharmaceutical University, Nanjing 210 009, People's Republic of China) **A 4,5-dioxoaporphine from the aerial parts of *Stephania tetrandra*.** *Journal of Natural Products*, v. 55(6): p. 828-829, 1992 (9 ref, Eng).

Chromatographic separation of the EtOH extract from the aerial parts of *S. tetrandra* resulted in the isolation of a novel 4,5-dioxoaporphine alkaloid, stephadione, together with six known alkaloids: corydione, oxonantenine, cassameridine, nantenine, cassythicine, and tetrandrine. The structure of stephadione was determined to be 6a,7-didehydro-1,2,9,10-dimethylenedioxo-4,5-dioxo-N-methylaporphine by a consideration of spectral evidence.

9301-0445 Siddiqui, S., Siddiqui, B.S.*, Adil, Q., Begum, S. (H E J Research Institute of Chemistry, University of Karachi, Karachi 75270, Pakistan) **Cardenolides and triterpenoids of the leaves of *Thevetia neriifolia*.** *Phytochemistry*, v. 31(10): p. 3541-3546, 1992 (22 ref, Eng).

A new cardenolide, neriifoside, 3 β -O-(α -L-acofriosyl)-14 β -hydroxy-5 α -carda-20:22-enolide has been isolated from the fresh, uncrushed leaves of *T. neriifolia*, along with the cardenolide peruvoside and lupeol acetate previously reported from the seeds and bark of this plant, respectively. A steroid 4,16-pregnadien-12 β -hydroxy-3,20-dione and four pentacyclic triterpenes: oleanolic acid, ursolic acid, α -amyrin acetate and β -amyrin acetate, hitherto unreported from this source, have also been isolated. These structures have been elucidated through detailed 1D and 2D NMR studies.

9301-0446 Singh, M., Siddiqui, I.R., Gupta, D., Singh, J. (Department of Chemistry, University of Allahabad, Allahabad, UP, India) **Isolation characterisation and synthesis of three new anthraquinone glycosides from *Cassia grandis*.** *Polish Journal of Chemistry*, v. 66(3): p. 469-475, 1992 (21 ref, Eng).

From the seeds of *C. grandis*, three glycosides viz; 2-O- β -D-glucopyranosyl-1,2,4,8-tetrahydroxy-6-methoxy-3-methyl anthraquinone, 3-O- β -D-glucopyranosyl-3-hydroxy-6,8-dimethoxy-2-methyl anthraquinone have been isolated. The structures were determined by spectroscopic methods.

9301-0447 Singh, R.B. (Department of Organic Chemistry, Agra College, Agra 282002, UP, India) **Structure elucidation of oligosaccharides from galactomannan of *Cassia auriculata* Linn.** *Polish Journal of Chemistry*, v. 66(3): p. 445-448, 1992 (22 ref, Eng).

Water soluble galactomannan from *C. auriculata* seeds furnished β -D-mannopyranosyl-(1 to 4)-O- β -D-mannopyranose; α -D-galactopyranosyl-(1-6)-O- α -D-mannopyranose and β -D-mannopyranosyl-(1 to 4)-O- β -D-mannopyranosyl-(1 to 4)-O- β -D-mannopyranose by partial acid hydrolysis.

9301-0448 Smadja, J., Vera, R. (Laboratoire de Chimie Organique, Université de La Réunion 15, avenue René-Cassin, 97489 Saint-Denis, Cedex, France) **Preliminary essay of some plants of the Reunion.** *Plantes Médicinales et Phytothérapie*, v. 25(4): p. 212-241, 1991 (27 ref, Eng, Fre).

Two hundred plants of Reunion Island (Indian Ocean) have been tested. Twenty of them contain flavonoids and ninety contain alkaloids. Several plants are used in the

traditional pharmacopocia and are well-known for anti-inflammatory, anti-rhumatic or healing properties.

9301-0449 Smith, A.B.III, Keenan, T.P., Gallagher, R.T., Furst, G.T., Dormer, P.G. (Department of Chemistry, the Monell Chemical Senses Center, and the Laboratory for Research on the Structure of Matter, University of Pennsylvania, Philadelphia, Pennsylvania 19104, USA) **Structures of breynins. A and B, architecturally complex, orally active hypocholesterolaemic spiroketal glycosides.** *Journal of Organic Chemistry*, v. 57(19): p. 5115-5120, 1992 (27 ref, Eng).

Breynin A and its oxy congener, breynin B have been isolated from the woody portion of Taiwanese shrub *Breynia officinalis* and their structures elucidated using NMR techniques including DEPT, heteronuclear chemical shift correlation, 1H-1H COSY, and inverse long-range 1H-13C experiments. Spectral data and direct oxidation of breynin A to B demonstrated that the latter is not the hemithiacetal as suggested previously, but rather the isomeric sulfoxide. Improved purification of the *Breynia* glycosides via droplet counter-current distribution and HPLC is also described.

9301-0450 Soni, P.L., Singh, A. (Chemistry of Forest Products, MFP Division, Forest Research Institute, Dehra Dun 248006, UP, India) **Structural characterisation of a glucan from the fruits of *Cassimiroa edulis*.** *Indian Journal of Chemistry*, v. 31B(11): p. 793-795, 1992 (14 ref, Eng).

Chemical and NMR spectroscopic methods have been used for structural elucidation of a D-glucan isolated from the fruits of *C.edulis*. The back bone of the polymer is composed of D-glucan moieties bearing Beta- (1-6) and alpha-(1-2) linkages. The side chains are joined to the 1-6 linked glucose main chain by 1-2 linkages. 13C-NMR signals of anomeric carbon and positional carbon linkages are assigned in comparison with the spectra of glucobioses.

9301-0451 Souleles, C. (Laboratory of Pharmacognosy, Department of Pharmacy, University of Thessaloniki, 54006 Thessaloniki, Greece) **New prenylated flavanone from *Melilotus alba*.** *Scientia Pharmaceutica*, v. 60(1-2): p. 101-104, 1992 (6 ref, Eng).

A new prenylated flavanone was isolated from the leaves and the flowers of *M.alba*. The structure was established on the basis of spectra data (UV, 1H-NMR, 13C-NMR, MS) as: 2,3-dihydro-5,7-dihydroxy-2-3',4'-dimethoxy-5'-(3-methyl-2-butenyl)phenyl-4H-benzopyran-4-one.

9301-0452 Speranza, G., Manitto, P., Monti, D., Pezzuto, D. (Dipartimento di Chimica Organica e Industriale, Universita di Milano and Centro di Studio sulle Sostanze Organiche Naturali, CNR, via Venezian 21, 20133 Milano, Italy) **Studies on Aloe, Part 10. Feroxins A and B, two O-glucosylated 1-methyltetralins from Cape Aloe.** *Journal of Natural Products*, v. 55(6): p. 723-729, 1992 (21 ref, Eng).

Two new O-glucosylated 1-methyltetralins, feroxins A and B, were isolated from a commercial sample of Cape aloe (*Aloe ferox*, *A.spicata*, *A.africana*). Their structures and preferred conformations in solution were determined by spectroscopic methods and chemical transformations.

9301-0453 Spraul, M.H., Nitz, S., Drawert, F., Duddeck, H., Hiegemann, M. (Institut für Lebensmitteltechnologie und analytische Chemie der T.U.München, D-8050 Freising-Weihenstephan, Germany) **Crispane and crispanone, two compounds from *Petroselinum crispum* with a new carbon skeleton.** *Phytochemistry*, v. 31(9): p. 3109-3111, 1992 (7 ref, Eng).

The analysis of parsley revealed the presence of two novel compounds, C₂₀H₃₀O₃ and C₂₀H₃₂O₃. They were isolated and purified by means of high counter-current chromatography and their structures were elucidated by spectroscopic methods and some chemical transformations. Their systematic names according to the chemical abstract nomenclature are *1S-1alpha, 2beta(Z), 4a alpha, 8a beta-1,2,4a,5,6,7,8,8a-octahydro-1-hydroxy-4-4a-dimethyl-1-(1-methyl-2-butenyl)-7-oxo-2-naphthalenyl-2-methyl-2-butenate* for compound 1 and *1S-1alpha, 2beta(Z), 4a alpha, 8a beta-1,2,4a,5,6,7,8,8a-octahydro-1-hydroxy-4,4a-dimethyl-1-(1-methyl-2-butenyl)-2-naphthalenyl-2-methyl-2-butenate* for compound 2. The trivial names crispanone and crispane, respectively are proposed.

9301-0454 Srivastava, S.K. (Central Institute of Medicinal and Aromatic Plants, Lucknow, UP, India) **A new triterpenoid saponin from *Schefflera impressa*.** *Journal of Natural Products*, v. 55(6): p. 810-813, 1992 (19 ref, Eng).

A new triterpenoid saponin, 3alpha,11alpha-dihydroxylup-20(29)-en-28-oic acid 28-O-beta-D-glucopyranosyl-(1-6)-beta-D-glucopyranoside, has been isolated from the bark and stem of *S.impressa*. Its structure has been deduced from spectroscopic data and by chemical correlation with compounds of established structure.

9301-0455 Srivastava, V.K., Sethi, K.L., Maheshwari, M.L. (NBPGR, Pusa Campus, New Delhi 110012, India) **Opium poppy alkaloids profile in Indian germplasm collections.** *Indian Journal of Plant Genetic Resources*, v. 3(1): p. 71-75, 1990 (6 ref, Eng).

The analysis of major alkaloids of opium poppy (*Papaver somniferum*) germplasm was made by liquid chromatographic method, which revealed a very high morphine alkaloids content in some of the strains. Studies have further showed that the formation of morphine alkaloids and isoquinoline alkaloids in opium gum was negatively correlated. This information could be useful in breeding varieties with high morphine content.

9301-0456 Srivastava, V.K., Maheshwari, M.L., Sethi, K.L. (National Bureau of Plant Genetic Resources, New Delhi, India) **Effect of lancing on alkaloids profile of capsules in opium poppy.** *Indian Journal of Plant Genetic Resources*, v. 2(1): p. 18-20, 1989 (6 ref, Eng).

An attempt has been made to develop a method for the extraction of alkaloids from the poppy *Papaver somniferum* capsules and analysed over HPLC. The lanced and unlanced capsules of four varieties and two control varieties, were analysed. It was observed that unlanced capsules have greater proportion of alkaloid contents in comparison to lanced capsules. Hence, unlanced capsules can be used for better production of alkaloids.

9301-0457 Sun, F., Benn, M. (Chemistry Department, The University of Calgary, Alberta, Canada T2N 1N4) **Norditerpenoid alkaloids from seeds of Delphinium zalil.** *Phytochemistry*, v. 31(9): p. 3247-3250, 1992 (18 ref, Eng).

Seven norditerpenoid alkaloids were isolated from the seeds of *D. zalil*. Six proved to be the known bases antheidolphenine, brownine, desacetylnudicauline, lycoctonine, methyllycaconitine and nudicauline, while the seventh was a new compound, zaliline, whose structure was established by spectrometric methods and partial synthesis.

9301-0458 Sung, T.V., Steffan, B., Steglich, W., Klebe, G., Adam, G. (Institute of Natural Products Chemistry, Nghia-do, Tu Liem, Hanoi, Vietnam) **Sesquiterpenoids from the roots of Homalomena aromatica.** *Phytochemistry*, v. 31(10): p. 3515-3520, 1992 (24 ref, Eng).

From roots of *H. aromatica* three new sesquiterpene alcohols, 1beta,4beta,7alpha-trihydroxyeudesmane, homalomenol A, and homalomenol B were isolated together with oplopanone, oplodiol and bullatantriol. The structures of the new constituents were elucidated by spectroscopic investigations and chemical transformations.

9301-0459 Sutton, C.J., Keegans, S.J., Kirk, W.D.J., Morgan, E.D. (Department of Biological Sciences, Keele University, Keele, Staffordshire ST5 5BG, UK) **Floral volatiles of Vicia faba.** *Phytochemistry*, v. 31(10): p. 3427-3428, 1992 (13 ref, Eng).

The volatile odour chemical of the flowers of *V. faba* (field bean) has been identified as (E)-beta-ocimene with only traces of other monoterpenes and an absence of esters, alcohols and other oxygenated compounds.

9301-0460 Tan, R.X., Jia, Z.J., Zhao, Y., Feng, S.L. (Institute of Organic Chemistry, State Key Laboratory of Applied Organic Chemistry, Lanzhou University, Lanzhou 730000, P.R.China) **Sesquiterpenes and acetylenes from Artemisia feddei.** *Phytochemistry*, v. 31(9): p. 3135-3138, 1992 (14 ref, Eng).

The aerial part of *A. feddei* contained one new germacranolide, two C14 acetylenes and seven known compounds. The structures were elucidated mainly by high field NMR techniques.

9301-0461 Tanaka, J., Miki, H., Higa, T.* (Department of Marine Sciences, University of the Ryukyus, Nishihara, Okinawa 903-01, Japan) **Echinofuran, a new furanosesquiterpene from the gorgonian Echinogorgia praelonga.** *Journal of Natural Products*, v. 55(10): p. 1522-1524, 1992 (9 ref, Eng).

Echinofuran (C15H18O), which inhibits cell division of fertilized sea urchin eggs, was isolated from the gorgonian *E. praelonga*. The structure was determined from spectroscopic data and the absolute configuration by transformation into a known derivative.

9301-0462 Tanaka, R., Matsunaga, S.* (Osaka University of Pharmaceutical Sciences, 2-10-65 Kawai, Matsubara, Osaka 580, Japan) **Saturated hopane and gammacerane triterpene-diols from the stem bark of Abies veitchii.** *Phytochemistry*, v. 31(10): p. 3535-3539, 1992 (26 ref, Eng).

Two saturated pentacyclic triterpene diols were isolated from the stem bark of *A. veitchii* and their structures characterized as hopan-3alpha,22-diol and gammaceran-3beta,21alpha-diol on the basis of chemical and spectral evidence.

9301-0463 Tih, A., Martin, M.T., Tih, R.G., Vuidepot, I., Sondengam, B.L., Bodo, B. (Laboratoire de Chimie, URA 401 CNRS, Museum National d'Histoire Naturelle, 63 rue Buffon, 75005 Paris, France) **Lophiroflavans B and C, tetraflavonoids of Lophira alata.** *Phytochemistry*, v. 31(10): p. 3595-3599, 1992 (10 ref, Eng).

Two new tetraflavonoids, lophiroflavans B and C, were isolated from the stem bark of *L. alata* along with lophirochalcone and lophiroflavan A and their structures determined from spectroscopic and chemical evidences.

9301-0464 Tinto, W.F., Blair, L.C., Reynolds, W.F.*, McLean, S. (Department of Chemistry, University of Toronto, Toronto, M5S 1A1, Canada) **Terpenoid constituents of *Oxandra asbeckii*.** *Journal of Natural Products*, v. 55(6): p. 701-706, 1992 (4 ref, Eng).

Three C31 triterpenoids, formally derived from 24-methylstanane, have been identified in the leaves of *O.asbeckii*. The structures of two of these compound were assigned as 2,3-dioxo-oxandran-2-one, and 3-hydroxyoxandran-2-one, on the basis of the spectroscopic characteristics of the natural products and their derivatives. Two-dimensional NMR methods, especially 2- and 3-bond ¹³C-¹H shift-correlation experiments using the FLOCK pulse sequence, were of paramount importance for these assignments. The third triterpenoid, 3-hydroxyoxandran-2-one, was obtained, after acetylation of the crude residue, as its acetate 8. A series of nOe difference measurements carried out on 8 established the main stereochemical features of the oxandran skeleton. The leaves also afforded the alkaloid liriodenine and the sesquiterpene spathulenol.

9301-0465 Tinto, W.F., John, L.M.D., Reynolds, W.F., McLean, S.* (Centre for Natural Products Chemistry, University of Guyana, Georgetown, Guyana) **Triterpenoids of *Jatropha gossypifolia*.** *Journal of Natural Products*, v. 55(6): p. 807-809, 1992 (4 ref, Eng).

Two new triterpenes, the trihydroxy ketone and the corresponding diosphenol have been isolated from the leaves of *J.gossypifolia*. Structures have been assigned by 2D NMR spectroscopy; the value of FLOCK pulse sequence is illustrated.

9301-0466 Torres, R., Villarroel, L., Urzua, A.(Departamento de Quimica, Facultad de Ciencias, Universidad de Santiago, Casilla 5659, Santiago-2, Chile) **Constituent of *Berberis congestiflora* and *Berberis horrida*.** *Fitoterapia*, v. 63(4): p. 376-378, 1992 (6 ref, Eng).

Isolation of patagonine, pakistanamine, berberine and thalifendine from leaves and stems of *B.congestiflora* and ciclanoline, berberine and calafatine from leaves and stems of *B.horrida* is reported.

9301-0467 Tu, Y.Q., Huang, G.S., Ma, Y.X., Wu, X.L., Song, Q.B. (Department of Chemistry, Lanzhou University, Lanzhou, Gansu Province, People's Republic of China) **Alkaloids from *Celastrus angulatus*.** *Journal of Natural Products*, v. 55(9): p. 1320-1322, 1992 (6 ref, Eng).

Four new beta-dihydroagarofuran alkaloids were isolated from the seed oil of *C.angulatus*. Their structures were elucidated as 1beta-acetoxy-9beta-benzoyloxy-8alpha-hydroxy-13-nicotinoyloxy-beta-dihydroagarofuran, 1beta-acetoxy-9beta-benzoyloxy-8-alpha (alpha-methyl-

butanoyloxy)-13-nicotinoyloxy-beta-dihydroagarofuran, 1beta-acetoxy-9beta-benzoyloxy-8-alpha-isobutanoyloxy-13-nicotinoyloxy-beta-dihydroagarofuran and 1beta-acetoxy-8beta, 9beta-dibenzoyloxy-3-nicotinoyloxy-beta-dihydroagarofuran.

9301-0468 Tumen, G., Sezik, E., Baser, K.H.C.(Uludag University, Faculty of Education, Department of Biology, 10100 Bahkesir, Turkey) **The essential oil of *Satureja parnassica* heldr. & Sart. ex Boiss subsp. *sipylea* P.H. Davis.** *Flavour and Fragrance Journal*, v. 7(1): p. 43-46, 1992 (45 ref, Eng).

The volatile constituents of *S.parnassica* subsp.*sipylea* were studied for the first time. 47 Compounds, out of 67 detected, were identified by means of capillary GC and GC-MS. The identified components represent about 95.5 percent of the oil. The major constituents found were carvacrol (49.9 percent) and p-cymene (20.1 percent). In addition 33.7 percent terpene hydrocarbons, 6.4 percent monoterpenic alcohols, and 1.6 percent sesquiterpene hydrocarbons were present.

9301-0469 Ulubelen, A., Topcu, G., Tan, N.(Faculty of Pharmacy, University of Istanbul, Istanbul, Turkey) **Rearranged abietane diterpenes from *Salvia candidissima*.** *Phytochemistry*, v. 31(10): p. 3637-3638, 1992 (18 ref, Eng).

In addition to two diterpenoids, 11-hydroxy-12-methoxyabieta-8,11,13-trien and 1-oxosalvipisone, nine known compounds, 14-oxopimaric acid, ferruginol, horminone, 7-acetylhorminone, cryptanol, montbretyl 12-methyl ether, microstegiol, 1-oxo-aethiopinone and salvipisone were isolated from the roots of *S.candidissima*.

9301-0470 Ulubelen, A., Mericli, A.H., Mericli, F., Ilarslan, R., Matlin, S.A.(Faculty of Pharmacy, University of Istanbul, Istanbul, Turkey) **Two C20 diterpenoid alkaloids from *Delphinium venulosum*.** *Phytochemistry*, v. 31(9): p. 3239-3241, 1992 (16 ref, Eng).

From the aerial parts of *D.venulosum* two known alkaloids, hetisine and hetisinone, and two new C20 alkaloids, venulol and venulone, were isolated. Their structures were established by spectral data.

9301-0471 Ulubelen, A., Topcu, G., Tuziacci, E.(Faculty of Pharmacy, University of Istanbul, Istanbul, Turkey) **New diterpenoids from *Salvia divaricata*.** *Journal of Natural Products*, v. 55(10): p. 1518-1521, 1992 (6 ref, Eng).

Three new diterpenoids, 6-oxoroleanone-18-oic acid (C₂₀H₂₄O₆), 6-oxo-12-methylroleanone-18-oic acid (C₂₁H₂₆O₆), and horminone-18-oic acid (C₂₀H₂₆O₆), and a new linear sesquiterpene, salvinine (C₁₅H₂₆O₃),

together with a group of known aromatic acids, were isolated from the aerial parts of *S.divaricata*.

9301-0472 Upadhaya, S.P., Ikuyo Okuda, Adhikary, S.R.(Royal Drug Research Laboratory, Thapathali, Kathmandu, Nepal) **Examination of essential oils in the needles of *Abies spectabilis* (Himalayan Silver Fir).** *Journal of Nepal Chemical Society*, v. 10: p. 20-24, 1991 (6 ref, Eng).

Needles and twigs from two specimens of *A.spectabilis* (Himalayan Silver Fir) trees growing under natural conditions at two different locations, i.e. Rasuwa(sample A) and Kalinchok(sample B) in the Himalayan region of Central Nepal were hydro-distilled and the volatile oils were analysed by GC and GC-MS. The oils from the two locations although showing a large number of similar constituents showed significant differences in their quantities. For example, the major constituents of the oil from sample A (Rasuwa) were identified as alpha-pinene (3.0 percent), camphene (3.5 percent), beta-pinene (5.1 percent), limonene (6.1 percent), bornyl acetate (4.2 percent) and carvone (5.8 percent) and those from sample B (Kalinchok) were identified as alpha-pinene (10.3 percent), camphene (9.3 percent), beta-pinene(3.3 percent), limonene (2.3 percent), and bornyl acetate (15.5 percent). Carvone in sample B was found to be only 0.75 percent. Bornyl acetate was isolated from sample B in which it was the main component.

9301-0473 Van Beem, J., Kornegay, J., Lareo, L.(Bean Program, Centro Internacional de Agricultura Tropical (CIAT), AA 6713, Cali, Colombia) **Nutritive value of the nuna popping bean.** *Economic Botany*, v. 46(2): p. 164-170, 1992 (23 ref, Eng).

Phaseolus vulgaris, commonly called popping beans, are traditionally grown in the Andean highlands of South American, and are consumed as a snack food after a quick toasting process. Proximate analysis of their nutritive value is given. Antinutritional factors such as lectins were higher in raw and boiled nuna samples than in toasted nunas, while tannin levels did not change from raw to toasted treatments. Overall in-vitro digestibility was slightly lower for toasted nunas than boiled dry bean.

9301-0474 Vaverkova, S., Holia, M.(Katedra farmakognosie a botaniky, Farmaceutickej fakulty Univerzity Komenskeho, Bratislava) **Qualitative properties of three species of genus *Salvia*.1. Content and composition of the essential oil.** *Ceskoslovenska Farmacie*, v. 41(3): p. 102-104, 1992 (10 ref, Cze, Eng).

The essential oil from *Salvia lavandulifolia* when compared with that from *S.officinalis* contained a higher amount of comphor and 1,8-cineole and a negligible

amount of thujone. The essential oil from *S.sclarea* contained linolool and linalyl acetate as the main constituents..

9301-0475 Veen, G., Gunther, S., Greinwald, R., Bachmann, P., Witte, L., Kustrak, D., Czygan, F.C.(Department of Pharmaceutical Biology, University of Wurzburg, Mittlerer Dallenbergweg 64, 8700 Wurzburg, F R G) **Quinolizidine alkaloids in *Petteria ramentacea*.** *Phytochemistry*, v. 31(10): p. 3487-3490, 1992 (23 ref, Eng).

Twenty-five quinolizidine alkaloids, and the dipiperidyl alkaloid, ammodendrine, have been found in *P.ramentacea*. Nineteen alkaloids are described for the first time in this plant. Cytisine-12-carboxy-methylester represented a new quinolizidine alkaloid. The distribution of alkaloids in buds, leaves, flowers, ripe pods, unripe fruits, seeds, stem bark, stem wood and roots was investigated. The alkaloid content and alkaloid profile changed strongly during the vegetation period.

9301-0476 Velasco-Negueruela, A., Perez-Alonso, M.J.(Departamento de Biologia Vegetal I. Facultad de Biologia, Universidad Complutense 28040, Madrid, Spain) **New results on the chemical composition of essential oils from Iberian species of *Thymus*.** *Botanica Complutensis*, v. 16: p. 91-97, 1990 (10 ref, Spa, Eng).

Using gas chromatography and infrared spectroscopy the qualitative and quantitative composition of the volatile oils of *T.loscosii*, *T.carnosus*, *T.camphoratus*, *T.mastigophorus* and *T.zygis* subspecies *zygis* has been studied and results are discussed.

9301-0477 Wang, D.Z., Ma, G.E., Xu, R.S.(Shanghai Institute of Materia Medica, Academia Sinica, Shanghai 200 031, China) **Studies on the alkaloids of *Cephalotaxus* VII. Structures and semi-synthesis of two anticancer cephalotaxine esters.** *Acta Pharmaceutica Sinica*, v. 27(3): p. 173-177, 1992 (10 ref, Chi, Eng).

Two new alkaloids, namely neoharringtonine and anhydroharringtonine with significant antileukemic activity were isolated from *C.fortunei*. Their structures have been established by spectral analyses and semisynthesis. Seven known alkaloids, deoxyharringtonine, isoharringtonine, isocephalotaxinone, acetylcephalotaxine, cephalotaxine, harringtonine and homoharringtonine, were also isolated and identified.

9301-0478 Wang, S., Wang, F.P.(Department of Chemistry of Natural Medicinal Products, College of Pharmacy, West China University of Medical Sciences, Chengdu 610041, China) **Studies on the chemical components of *Rhodiola***

crenulata. *Acta Pharmaceutica Sinica*, v. 27(2): p. 117-120, 1992 (12 ref, Chi, Eng).

Six chemical components were isolated from the roots of *R.crenulata*. Five of them were identified as known salidroside, p-tyrosol, pyrogallol, gallic acid and beta-sitosterol, based on comparison of its R_f(TLC), mmp and spectral data with those of authentic samples. The sixth component was found to be a new delta isopentenyl-3-O-beta-D-glucopyranoside and named as crenulatin. Its structure was confirmed on the basis of its spectral data (IR, MS, ¹H- and ¹³C NMR).

9301-0479 Weyerstahl, P., Christiansen, C.(Institut für Organische Chemie, Technische Universität Berlin Strasse des 17 Juni 135, D-1000 Berlin 12, Germany) **Constituents of the essential oil of *Heteropyxis natalensis*.** *Journal of Essential Oil Research*, v. 4(5): p. 439-445, 1992 (12 ref, Eng).

Essential oil of *H.natalensis* (lavender tree) was analyzed and found to contain more than 90 percent of monoterpenes (hydrocarbons and oxygenated compounds). The composition is strongly dependent on the season. The oil produced in the summer contained (E)-beta-ocimene (29 percent), linalool (25 percent), myrcene (8.5 percent), 1,8-cineole (9.5 percent), p-mentha-1(7),8-diene (6 percent) and limonene (6 percent), whereas the oil produced in the winter was richer in 1,8-cineole (40 percent and limonene (21 percent), lower in (E)-beta-ocimene (6 percent), myrcene (4 percent) and p-mentha-1(7),8-diene (1.5 percent) and very low in linalool (1 percent).

9301-0480 Weyerstahl, P., Marschall, H., Kaul, V.K.(Institut für Organische Chemie, Technische Universität Berlin, Strasse des 17. Juni 135, D-1000 Berlin 12, Germany) **The essential oil of *Artemisia moorcroftiana* Wall..** *Flavour and Fragrance Journal*, v. 7(2): p. 73-77, 1992 (11 ref, Eng).

The essential oil of the aerial parts of *A.moorcroftiana* was investigated by a combination of chromatographic and spectroscopic methods. This essential oil was found to possess a penetrating herbaceous-green odour. The main constituents of the essential oil were beta-pinene (7.7 percent), 1,8-cineole (5.8 percent), artemisia ketone (10.2 percent), alpha- and beta-thujone (12.8 and 4.0 percent), camphor (5 percent). Major components of the sesquiterpenes were germacrene-D (2.3 percent), (E)-nerolidol (2.6 percent), vulgarone B (alpha-longipinen-1-one, 2.6 percent) and a new sesquiterpene alcohol alpha-longipinen-7beta-ol (1.4 percent).

9301-0481 Weyerstahl, P., Marschall, H., Landrum, L.R.(Institut für Organische Chemie, Technische Univer-

sität Berlin, Strasse des 17 Juni 135, D-1000 Berlin 12, Germany) **Constituents of the leaf extract of *Amomyrtus meli* (R.A. Philippi) Legrand et Kausel, *Amomyrtus luma* (Molina) Legrand et Kausel and of *Amomyrtella guili* (Speg.) Kausel.** *Flavour and Fragrance Journal*, v. 7(5): p. 247-251, 1992 (12 ref, Eng).

The absolute from the leaves of *A.meli* was dominated by 1-phenylpentan-3-one (1, 36/27 percent) and 1-phenylhexan-3-one (3, 32/53 percent). The absolute of *A.luma* was more complex, and found to 1 (4.6/8.5 percent) and 3 (3.5/12.3 percent) as well as beta-caryophyllene oxide (10.7/6.6 percent) and linalol (5903:11.3 percent). The principal constituents of the absolute of *Amomyrtella guili* were methyl eugenol (48.5 percent) and (E)-methyl isoeugenol (6.7 percent), but 1(3.1 percent) and 3(4.4 percent) were also present.

9301-0482 Wijeratne, E.M., Bandara, B.M.R., Gunatilaka, A.A.L., Tezuka, Y., Kikuchi, T.(Department of Chemistry, University of Peradeniya, Peradeniya, Sri Lanka) **Chemical constituents of three Rutaceae species from Sri Lanka.** *Journal of Natural products*, v. 55(9): p. 1261-1269, 1992 (40 ref, Eng).

The stem bark of *Luvunga angustifolia* yielded a new acridone alkaloid, 5-methoxyarborinine, and several known compounds. Several known compounds were also isolated from *Limonia acidissima*. *Pleiospermium alatum* afforded a rare coumarin glycoside, apiosylskimmin, and two known limnoids. A probable biosynthetic relationship between some limonoids of the Rutaceae is suggested.

9301-0483 Wong, K.C., Ong, K.S., Lim, C.L.(School of Chemical Sciences, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia) **Composition of the essential oil of rhizomes of *Kaempferia galanga* L..** *Flavour and Fragrance Journal*, v. 7(5): p. 263-266, 1992 (10 ref, Eng).

The composition of the essential oil of rhizomes of *K.galanga* growing in Malaysia has been investigated by capillary GC, GC-MS and ¹H-NMR. The oil contained 54 components, of which the major constituents were ethyl trans-p-methoxycinnamate (51.6 percent), ethyl cinnamate (16.5 percent), pentadecane (9.0 percent), 1,8-cineole (5.7 percent), gamma-car-3-ene (3.3 percent) and borneol (2.7 percent). Terpenoid constituents amounted to 16.4 percent.

9301-0484 Woo, E.H., Woo, W.S.*, Chmurny, G.N., Hilton, B.D. (NCI-Frederick Cancer Research and Development Center, P O Box B, Frederick, Maryland 21702-1201) **Melandrioside A, a saponin from *Melandrium firmum*.** *Journal of Natural Products*, v. 55(6): p. 786-794, 1992 (17 ref, Eng).

A new nortriterpene glycoside named melandrioside A was isolated from *M.firmum*, and its structure was elucidated as 3-O-(beta-D-galactopyranosyl-(1-2)-(alpha-L-rhamnopyranosyl-(1-4))-beta-D-glucuronopyranosyl)-melandrigenin by use of modern NMR spectroscopic techniques.

9301-0485 Wu, W.J., Tu, Y.Q., Liu, H.X., Zhu, J.B. (Department of Plant Protection, Northwestern Agricultural University, Wugon, Shaanxi Province, People's Republic of China) **Celangulins II, III and IV: New insecticidal sesquiterpenoids from *Celastrus angulatus*.** *Journal of Natural Products*, v. 55(9): p. 1294-1298, 1992 (9 ref, Eng).

Three new insecticidal sesquiterpene polyol esters were isolated from the root bark of *Celastrus angulatus*. Their structures were determined, mainly by NMR and MS, as 1beta, 2beta, 6alpha-triaacetoxy-12-isobutanoyloxy-8beta, 9alpha-di(beta-furancarboxyloxy)-4alpha-hydroxy-beta-dihydroagarofuran(celangulin II), 1beta, 2beta, 6alpha, 8beta-tetraacetoxy-9alpha-benzoyloxy-12-isobutanoyloxy-4alpha-hydroxy-beta-dihydroagarofuran(celangulin III), and 1beta, 2beta, 6alpha, 8beta-tetraacetoxy-9beta-benzoyloxy-12-isobutanoyloxy-4alpha-hydroxy-beta-dihydroagarofuran(celangulin IV).

9301-0486 Xiao-Hong Zhou, Kasai, R., Ohtani, K., Tanaka, O., Rui-Lin Nie, Chong-Ren Yang, Jun Zhou, Yamasaki, K.* (Institute of Pharmaceutical Sciences, Hiroshima University School of Medicine, Kasumi, Minami-ku, Hiroshima 734, Japan) **Oleanane and ursane glucosides from *Rubus* species.** *Phytochemistry*, v. 31(10): p. 3642-3644, 1992 (16 ref, Eng).

A new oleanane-glucoside was isolated from the leaves of three *Rubus* species viz., *R.acuminatus*, *R.ellipticus* and *R.multibreatus* collected in Yunnan, southern China, along with several known ursane- and oleanane-type triterpene glucosides. The structures of these compounds were established by spectroscopic and chemical means.

9301-0487 Xiao-Ru, S., Hou-Wei, L.*, Sakai, T., Niwa, M. (Department of Phytochemistry, China Pharmaceutical University, Nanjing 210009, China) **Pentacyclic triterpenes from *Salvia paramiltiorrhiza*.** *Shoyakugaku Zasshi*, v. 46(3): p. 202-205, 1992 (10 ref, Eng, Jap).

Examination of the roots of *S.paramiltiorrhiza* showed that triterpenoids and diterpenoids are its main constituents. One new triterpene and six known triterpenes were isolated and characterized structurally.

9301-0488 Xu, Y.J., Xu, D.M., Luo, G., Huang, E.X., Wu, X.Y., Jin, X.Q., Cui, D.B., Liu, S.Y. (Institute of Traditional Chinese Medicine and Materia Medica of Jilin Province, Changchun 130 021, China) **Isolation and identification of Yibeissine.** *Acta Pharmaceutica Sinica*, v. 27(2): p. 121-124, 1992 (8 ref, Chi, Eng).

A new steroidal alkaloid, yibeissine along with a known alkaloid was isolated from the bulbs of *Fritillaria pallidiflora* by column chromatography. Their structures have been determined on the basis of chemical and spectral data.

9301-0489 Xue, S.R., Liu, J.Q., Wang, G., Shi, J.Q., Wu, Q.J., Hu, S.Z. (Department of Pharmacy, Anhui College of Traditional Chinese Medicine, Hefei 230 038, China) **Studies on the triterpenoid saponin of *Clinopodium chinense* (Benth) O. Kuntze.** *Acta Pharmaceutica Sinica*, v. 27(3): p. 207-212, 1992 (5 ref, Chi, Eng).

A new triterpenoid saponin named clinopodiside was isolated from *C.chinense*. The structure of clinopodiside A was elucidated by spectroscopic and X-ray diffraction analysis as 3-O-beta-D-glucopyranosyl (1 to 6)-{beta-D-glucopyranosyl (1 to 4)-beta-D-glucopyranosyl-olean-11, 13(18)-diene-3beta, 16beta, 23, 28-tetrol.

9301-0490 Yadava, R.N., Jain, B. (Department of Chemistry, Dr Hari Singh Gour University, Sagar 470 003, MP, India) **Gossypetin 7-O-beta-D-glucopyranoside, a novel flavonol glycoside from *Impatiens scabrida* D.C..** *Asian Journal of Chemistry*, v. 4(4): p. 936-938, 1992 (11 ref, Eng).

Phytochemical examination of *I.scabrida* resulted in the isolation and identification of a novel flavonoid glycoside gossypetin-7-O-beta-D-glucopyranoside. NSL, New Delhi.

9301-0491 Yang, X.J., Xu, L.Z., Sun, N.J., Wang, S.C., Zheng (Institute of Medicinal Plant Development, Chinese Academy of Medical Sciences, Beijing 100 094, Chinese) **Studies on the chemical constituents of *Annona squamosa*.** *Acta Pharmaceutica Sinica*, v. 27(3): p. 185-190, 1992 (13 ref, Chi, Eng).

Twelve compounds (AS 1-12) were isolated from *A.squamosa*. Their structures were identified as liriodenine, moupinamide, (-)-kauran-16alpha-ol-19-oic acid, 16beta, 17-dihydroxy(-)-kauran-19-oic acid, anonaine, 16alpha, 17-dihydroxy(-)-kauran-19-oic acid, (-)-isokaur-15(16)-en-17, 19-dioic acid, squamosamide, 16alpha-methoxy(-)-kauran-19-oic acid, sachanoic acid, (-)-kauran-19-al-17-oic acid, daucosterol. Among them, squamoside is a new amide and 16alpha-methoxy(-)-kauran-19-oic acid is a new natural product.

9301-0492 Yi, J.H., Zhong, C.C., Luo, Z.Y., Xiao, Z.Y. (Sichuan Institute of Chinese Materia Medica, Chongqing, 630 065, China) **Structure of lamiophlomiol C.** *Acta Pharmaceutica Sinica*, v. 27(3): p. 204-206, 1992 (5 ref, Chi, Eng).

A new highly oxygenated iridoid, lamiophlomiol C isolated from the alcohol soluble fraction of the roots of *L.rotata*, was shown to have the molecular formula C₁₁H₁₄O₇. On the basis of UV, IR, MS and NMR spectroscopic data, particularly X-ray crystallographic analysis, the structure of this iridoid was established.

9301-0493 Yu, S.S., Xiao, Z.Y. (Institute of Materia Medica, West China University of Medical Sciences, Chengdu 610044, China) **The structure of Yiyeliangwanoside III and IV from the bark of Nothopanax davidii (France) Harms.** *Acta Pharmaceutica Sinica*, v. 27(1): p. 42-47, 1992 (4 ref, Eng).

Two new oleanane type triterpene glycosides, were isolated from *N.davidii*. Their chemical structure was elucidated by means of chemical and spectrometric analysis. The compounds were named as yiyeliangwanoside III (C₅₇H₈₈O₂₅, mp 206-210 degree C and yiyeliangwanoside IV (C₃₇H₅₆O₁₀, mp 267-170 degree C).

9301-0494 Zhang, H., Yan, W., Cheng, D., Zheng, Q. (Faculty of Pharmacy, Beijing College of Traditional Chinese Medicine, Beijing 100 029, China) **An iridoid from Siphonostegia chinensis.** *Phytochemistry*, v. 31(9): p. 3268-3269, 1992 (2 ref, Eng).

A new iridoid, siphonostegiol, has been isolated from the aerial parts of *S.chinensis*. Its structure was established by spectroscopic methods and confirmed by X-ray diffraction for single crystal.

9301-0495 Zhang, H.Y., Yan, W.M., Chen, D.C. (Faculty of Pharmacy, Beijing College of Traditional Chinese Medicine, Beijing 100029, China) **The structure identification of pyridinemono terpene isocantleyine.** *Acta Pharmaceutica Sinica*, v. 27(2): p. 113-116, 1992 (8 ref, Chi, Eng).

Siphonostegia chinensis aerial parts afforded four compounds (I-IV) which were identified on the basis of spectroscopic analysis. Compound I was shown to be a new pyridinemonoterpene alkaloid and its structure was determined as 5H-2 pyridine-4-carboxylic acid, 6,7-dihydro-6-hydroxy-7-methyl-methyl ester. Compound III was identified as the known compound loliolide. The other two compounds were not identified.

9301-0496 Zhong-Jian, J., Zi-Min, L. (Institute of Organic Chemistry, State Key Laboratory of Applied Organic Chemistry, Lanzhou University, Lanzhou 730000, People's Republic of China) **Phenylpropanoid and iridoid glycosides from Pedicularis longiflora.** *Phytochemistry*, v. 31(9): p. 3125-3127, 1992 (11 ref, Eng).

From the ethanolic extract of whole plants of *P.longiflora*, two new compounds, pedicularioside I and longifloroside, were isolated along with six known compounds, cistanoside D, cistanoside C, verbascoside, geniposidic acid, mussaenoside and loganic acid. On the basis of spectral and chemical evidence structures of pedicularioside I and longifloroside were determined.

9301-0497 Zhou, Yi-Fi, Tai, Gui-Hua, Zhang, Yi-Shen (Department of Biology, Northeast Normal University, Changchun, 130024, China) **Studies on water soluble polysaccharides isolated from the stem of Panax ginseng C.A. Mey.** *Acta Biochimica et Biophysica Sinica*, v. 24(1): p. 22-26, 1992 (14 ref, Eng).

The fraction S-2A was obtained from the crude polysaccharide isolated from the stem of *P.ginseng*. Methylation analysis and other experimental methods indicated that the main chains of S-2A are mainly composed of (1-3)-linked Gal residues, some of which have side chains joined through (1-6) linkages. NMR studies and oxidation with chromium trioxide suggested that in S-2A the Gal be partly beta, the Rha and Gal A be alpha the Glc have both alpha and beta configurations.

9301-0498 Ziegler, G., Spiteller, G. (Laboratoire der Aromachemie Erich Ziegler GmbH, D-8551 Aufsess, FRG) **A coumarin and a diterpene from Citrus sinensis (L.) Osbeck cv. valencia (Rutaceae).** *Flavour and Fragrance Journal*, v. 7(3): p. 141-145, 1992 (16 ref, Eng).

Osthole, 7-methoxy-8-(3-methylbut-2-enyl) coumarin, and gomerol were detected as trace constituents in the nonvolatile fraction of cold-pressed peel oil obtained from *Citrus sinensis* cv.valencia. Neither the coumarin nor the diterpene was previously known as a constituent of sweet orange oil. Gomerol was synthesized from manool to confirm its structure.

9301-0499 Ziegler, H., Spiteller, G. (Universitat Bayreuth, Lehrstuhl Organische Chemie 1, Postfach 101251, D-8580 Bayreuth, FRG) **Coumarins and psoralens from Sicilian lemon oil (Citrus limon (L.) Burm. f.).** *Flavour and Fragrance Journal*, v. 7(3): p. 129-139, 1992 (26 ref, Eng).

The coumarin fraction of cold-pressed Sicilian lemon oils (*C.limon*) was investigated by HPLC, MS, GC-MS and NMR. Twenty-nine structurally different compounds were identified. Eleven of these were previously unknown as

constituents of lemon oil. 5-(2'-3'-dihydroxy-3'-methylbutyloxy)-7-methoxycoumarin, 5-(2',3'-epoxy-3'-methylbutyloxy)-7-methoxycoumarin. 8-(7',8'-epoxygeranyloxy)psoralen as well as 5-(3'-methylbut-2'-enyloxy)-8-(2'',3''-dihydroxy-3''-methylbutyloxy)psoralen are hitherto unknown natural products. Moreover, a new derivatization method for the investigation of allyloxycoumarins based on mild hydrogenation is presented.

9301-0500 Zwaving, J.H., Bos, R. (Department of Pharmacognosy, University Centre for Pharmacy, State University Groningen, Ant. Deusinglaan 2, 9713 AW Groningen, The Netherlands) **Analysis of the essential oils of five *Curcuma* species.** *Flavour and Fragrance Journal*, v. 7(1): p. 19-22, 1992 (18 ref, Eng).

The chemical composition of the essential oils from the rhizomes of five *Curcuma* species from Indonesia and India was examined by GC-MS. The oils can be characterized by the following compounds: *C.xanthorrhiza*: ar-curcumene (41.4 percent) xanthorrhizol (21.5 percent); *C.domestica*: ar-turmerone (24.7 percent), turmerone (29.5 percent), turmerol (20.0 percent), alpha-atlantone (2.4 percent), *C.aromatica*: ar-curcumene (18.6 percent), beta-curcumene (25.5 percent), xanthorrhizol (25.7 percent); *C.aeruginosa*: isocurcumenol (8.5 percent), beta-eudesmol (6.5 percent), curdione (3.6 percent), curcumenol (9.9 percent), curcumanolides A,B (11.4 percent), dehydrocurdione (9.4 percent), curcumenone (1.9 percent); *C.heyneana*: 1,8-cineole/limonene (14.2 percent), isocurcumenol (7.4 percent), beta-eudesmol (4.7 percent), curcumanolides A,B (13.1 percent), dehydrocurdione (10.2 percent), curcumenone (2.3 percent).

Chemotaxonomy

9301-0501 Avato, P., Jacobsen, N., Smitt, U.W. (Dipartimento Farmaco-Chimico, Facolta di Farmacia, Universita degli Studi di Bari, 1-70125 Bari, Italy) **Chemotaxonomy of *Thapsia maxima* Miller. Constituents of the essential oil of the fruits.** *Journal of Essential Oil Research*, v. 4(5): p. 467-473, 1992 (19 ref, Eng).

The essential oils from the fruits of two different morphological types of *T.maxima* Miller (I and II), both with the chromosome number $2n=22$ (2x), have been characterized. The phenotypic traits of the plants and the results from the analyses of the essential oils by combined GC/MS are reported. The two phenotypes showed similar compositional patterns with limonene (34-27 percent) and methyl eugenol (59-63 percent) as main components, indicating that *T.maxima* I and II represent one chemotype within the

genus *Thapsia*. Neither of the two types contained thapsigargin in the roots.

9301-0502 Carnat, A.P., Madesclaire, M., Chavignon, O., Lamaison, J.L. (Laboratoire et Pharmacognosie et Phytotherapie, UFR de Pharmacie, BP 38, 63001 Clermont-Ferrand Cedex, France) **cis-Chrysanthenol, a main component in essential oil of *Artemisia absinthium* L. growing in Auvergne (Massif Central), France.** *Journal of Essential Oil Research*, v. 4(5): p. 487-490, 1992 (14 ref, Eng).

Wormwood, (*A.absinthium*) essential oil obtained by steam distillation has been investigated by GC and GC/MS. The main component was determined to be either (alpha+beta) thujone or cis-chrysanthenol, depending upon the maturation state of the plant. In wormwood harvested after flowering period (October or November), the amount of cis-chrysanthenol may reach more than 60 percent. The wormwood growing in Auvergne could be considered to be a new chemotype; a cis-chrysanthenol chemotype.

9301-0503 Kajiyama, K., Demizu, S., Hiraga, Y., Kinoshita, K., Koyama, K., Takahashi, K., Tamura, Y., Okada, K., Kinoshita, T. (Meiji College of Pharmacy at Setagaya, 1-35-23 Nozawa, Setagaya-ku, Tokyo 154, Japan) **Two prenylated retrochalcones from *Glycyrrhiza inflata*.** *Phytochemistry*, v. 31(9): p. 3229-3232, 1992 (11 ref, Eng).

Two new chalcones, licochalcones C and D, were isolated from the root of *G.inflata* together with three known chalcones echinatin, licochalcones A and B. Their structures were elucidated as 4,4'-dihydroxy-2-methoxy-3-prenyl-chalcone and 2-methoxy-3'-prenyl-3,4,4'-trihydroxy-chalcone, respectively, on a spectroscopic basis. All chalcones obtained from this plant are retrochalcones and lack an oxygen -functionality at the 2'-position. The biogenesis of retrochalcones is briefly discussed in relation to the chemotaxonomy of the genus *Glycyrrhiza*.

9301-0504 Kastner, U., Saukel, J., Zitterl-Eglseer, K., Langer, R., Reznicek, G., Jurenitsch, J., Kubelka, W. (Institut für Pharmakognosie der Universität Wien, Währinger Strasse 25, A-1090, Wien) **Essential Oil- an additional tool for the characterization of the Central European taxa of the *Achillea millefolium*-group.** *Scientia Pharmaceutica*, v. 60(1-2): p. 87-99, 1992 (59 ref, Eng, Ger).

GC-analysis of the essential oil was performed on dichloromethane extracts of 885 individuals belonging to the *A.millefolium*-group *A.setacea*, *A.asplenifolia*, *A.roseoalba*, *A.pratensis*, *A.collina*, *A.distans*, *A.stricta*, *A.millefolium* including e.g. *A.sudetica*, *A.pannonica*.

Based on clearly defined plant material trends in the relative amounts of thirteen known substances (alpha-pinene, camphene, sabinene, beta-pinene, p-cymene, eucalyptol, gamma-terpinene, thujone, camphor, borneol, alpha-terpineol, bornyl acetate, beta-caryophyllene) were observed, which are representative for the examined taxa and well correlated with morphological and other phytochemical features. The composition of these thirteen substances is independent of the age of drug and may therefore serve as additional tool for the identification of fresh and dried plant material.

9301-0505 Okuda, T., Yoshida, T., Hatano, T., Iwasaki, M., Kubo, M., Orime, T., Yoshizaki, M., Naruhashi, N. (Faculty of Pharmaceutical Sciences, Okayama University, Tsushima, Okayama 700, Japan) **Hydrolysable tannins as chemotaxonomic markers in the Rosaceae.** *Phytochemistry*, v. 31(9): p. 3091-3096, 1992 (27 ref, Eng).

A HPLC survey of leaves of 80 plants (62 species, 15 hybrids, one variety and two cytotypes) from 18 genera of four subfamilies of Rosaceae, using five oligomeric hydrolysable tannins, five monomeric hydrolysable tannins, and chlorogenic acid as reference compounds, showed that the oligomers can be used as chemotaxonomic markers for the family, viz., sanguin H-6 and H-11 in the genera *Sanguisorba* and *Rubus*, gemin A in *Geum*, agrimoniin in *Agrimonia*, *Fragaria* and *Potentilla* and rugosin D in *Filipendula*. The hydrolysable tannin monomers were widely distributed in the herbaceous and frutescent Rosoideae species, but not in the arborescent species of the other subfamilies. Chlorogenic acid was found in almost all the plants examined.

9301-0506 Ozguven, M., Sener, B., Kirici, S., Kusmenoglu, S. (Department of Field Crops, Faculty of Agriculture, University of Cukurova, Adana, Turkiye) **Drug yields and withanolide contents of *Withania somnifera* Dunal cultivated in Turkiye.** *Journal of Faculty of Pharmacy, Gazi*, v. 8(2): p. 89-100, 1991 (12 ref, Eng).

Drug yields, ontogenetic variability and withanolide contents of *Withania somnifera* cultivated in Turkey were investigated. The quantitative determination of the main withanolides of chemotypes collected from two different locations was carried out. They were identified according to the differences in concentration of their withanolide contents and found to be related to various locations.

9301-0507 Perez-Alonso, M.J., Velasco-Negueruela, A. (Departamento Biología Vegetal I, Facultad de Biología, Universidad Complutense de Madrid, Ciudad Universitaria, E-28040, Madrid, Spain) **Essential oil components of *Santolina chamaecyparissus* L.** *Flavour and Fragrance Journal*, v. 7(1): p. 37-41, 1992 (23 ref, Eng).

The essential oils from several *S. chamaecyparissus* subspecies from wild (Spanish insular and peninsular) and cultivated (Spanish and British) populations were examined. According to the composition of the volatiles three different groups are proposed: cultivated, insular, and peninsular samples. Artemisia ketone (27.8-35.6 percent) and T-cadinol (23.6-4.8 percent) were characteristic components in cultivated samples, whereas in the insular ones camphor (42.9 percent) and cubenol (17.3 percent) were the main compounds. Monoterpenes predominated in the essential oils of peninsular populations corresponding to subspecies *incana* (85.9 percent) and *squarrosa* (45.2-68.5 percent) of which camphor (9.2-24.9 percent), borneol (11.6-28.4 percent) and 1,8-cineole (2.3-8.7 percent) were the major components. Conversely, the essential oil of subspecies *tomentosa* was mainly composed of sesquiterpenes (61.4 percent), elemol (5.0 percent), nerolidol+spathulenol (9.3 percent), copaenol (15.2 percent), ledol (4.1 percent) and cubenol (6.7 percent) being the major components.

9301-0508 Putievsky, E., Ravid, U., Dudai, N., Katzir, I., Carmeli, D., Eshel, A. (Institute of Field Crops, Agricultural Research Organization, Neve Ya'ar, Haifa Post 31-999, Israel) **Variation in the essential oil of *Artemisia judaica* L. chemotypes related to phenological and environmental factors.** *Flavour and Fragrance Journal*, v. 7(5): p. 253-257, 1992 (21 ref, Eng).

The essential oil content and composition of *A. judaica* from the Sinai Peninsula (Egypt) and the Negev Desert (southern Israel) were found to be related to a variety of factors such as season, plant age, and different plant parts. Differences were found also from samples collected at various locations. The contents fluctuated with the season, reaching the highest level during the late summer. Seasonal variations in the essential oil content occurred one month earlier in Sinai plants than in Negev plants. The essential oil content in the leaves was higher than in the branches and flowers. No differences were found in the relative percentage of the components in the essential oil from different plant parts. Essential oil of *A. judaica* plants from the two regions was of two distinct chemotypes. An artemisyl-oil type was predominant in the Negev samples, while a piperitone-oil type was predominant in those collected in southern Sinai. These differences were evident in samples collected in the wild in all seasons, over a period of two years. Seedlings grown in a controlled environment, from seeds collected in the two regions, exhibited the same differences. These differences have been reported to reflect genetic differences between the two populations.

9301-0509 Quader, M.A., El-Turbi, J.A., Armstrong, J.A., Gray, A.I., Waterman, P.G. (Phytochemistry Research

Laboratories, Department of Pharmaceutical Sciences, University of Strathclyde, Glasgow G1 1XW, Scotland, UK) **Coumarins and their taxonomic value in the genus *Phebalium*.** *Phytochemistry*, v. 31(9): p. 3083-3089, 1992 (13 ref, Eng).

An examination of the aerial parts of 15 taxa (14 species, two subspecies) of *Phebalium* has confirmed the ubiquitous occurrence of coumarins in the genus. In total 34 coumarins were isolated, of which 28 are new to the genus and seven appear to be novel natural products. Earlier comments on the chemotaxonomic value of coumarins of *Phebalium* are updated in the light of these results.

9301-0510 Ravid, U., Putievsky, E., Katzir, I., Carmeli, D., Eshel, A., Schenk, H.P. (Department of Medicinal, Spice and Aromatic Plants, Agricultural Research organization, Neve Ya'ar, Haifa Post 31-999, Israel) **The essential oil of *Artemisia judaica* L. chemotypes.** *Flavour and Fragrance Journal*, v. 7(2): p. 69-72, 1992 (19 ref, Eng).

The composition of the essential oils of *A. judaica* from southern Israel (Negev) and from the Sinai was investigated by means of GC and GC-MS. Artemisia ketone and artemisia alcohol were predominant in two different Negev oil types, while piperitone was the major constituent of oils of *A. judaica* from the Sinai. The main difference between the chemotypes is the absence of most of the artemisyl-skeleton type compounds from the Sinai populations.

9301-0511 Reddy, M.S., Radhakrishnaiah (P.G. Department of Botany, Nizam College, Osmania University, Hyderabad 500001, AP, India) **Chemical systematics of *Vitex*.** *Advances in Plant Sciences*, v. 5 (special issue): p. 350-355, 1992 (21 ref, Eng).

The quantified data on the chemosystematics of five species of *Vitex* viz; *V. altissima*, *V. negundo*, *V. peduncularis*, *V. pinnata*, *V. trifolia* indicate that they are closely related, and constitute a single cluster. On the basis of distribution of iridoids and ellagic acid *V. pinnata* is recognised as a relatively primitive taxon.

9301-0512 Salgueiro, L.M.R. (Centro de Estudos Farmaceuticos (INIC), Laboratorio de Farmacognosia, Faculdade de Farmacia, University of Coimbra, 3000 Coimbra, Portugal) **Essential oils of endemic *Thymus* species from Portugal.** *Flavour and Fragrance Journal*, v. 7(3): p. 159-162, 1992 (5 ref, Eng).

Keys with taxonomic features and chemical composition of four endemic 'taxa' of *Thymus*: *T. villosus* subsp. *villosus*, *T. lotocephalus*, *T. camphoratus*, *T. capitellatus* and their essential oils are given. Some chemotypes of these taxa have been described for the first time.

9301-0513 Tomas-Barberan, F.A., Gil, M.I., Ferreres, F., Tomas-Lorente, F. (Laboratorio de Fitoquímica, CEBAS CSIC Apdo 4195, Murcia 30080, Spain) **Flavonoid p-coumaroylglucosides and 8-hydroxyflavone allosylglucosides in some Labiatae.** *Phytochemistry*, v. 31(9): p. 3097-3102, 1992 (22 ref, Eng).

Flavonoid p-coumaroylglucosides are present in all the species studied of the genera *Ballota*, *Phlomis* and *Marrubium*, and are universally present in the subgenus *Marrubiastrum* of *Sideritis*, in subgenus *Galeopsis* and in section *Betonica* of genus *Stachys*, while 8-hydroxyflavone 7-allosylglucosides accumulate in the other *Sideritis*, *Stachys* and *Galeopsis* species. Amongst the flavonoid p-coumaroylglucosides, the apigenin derivatives occur most frequently but also the corresponding luteolin, chrysoeriol, kaempferol and isorhamnetin glycosides have been detected. The 8-hydroxyflavone allosylglucosides occur as such and also as the monoacetylated and diacetylated derivatives. The presence of p-coumaroylglucosides and/or 8-hydroxyflavone allosylglucosides shows the affinities of *Anisomeles*, *Pogostemon*, and *Leonurus* species with *Ballota*, *Marrubium*, *Phlomis*, *Sideritis*, *Stachys* and *Galeopsis* species. These results suggest that flavonoid p-coumaroylglucosides are valuable markers for chemotaxonomic studies.

9301-0514 Von Rudloff, E., Lapp, M.S. (Plant Biotechnology Institute, National Research Council, Saskatoon Sask, Canada S7N0W9, Canada) **Chemosystematic studies in the genus *Pinus* VII. The leaf oil terpene composition of ponderosa pine, *Pinus ponderosa*.** *Canadian Journal of Botany*, v. 70(2): p. 374-378, 1992 (31 ref, Eng, Ger).

The leaf oil terpene composition of ponderosa pine (*P. ponderosa* from 37 sites was determined. Tree to tree variation was quite low, as was between population variability at all northwestern locations. Quantitative and qualitative differences in several leaf oil terpenes were found between these and the eastern populations, which lends strong support to the taxonomic separation of ponderosa pine into the typical variety *ponderosa* and the northeastern variety *scopulorum*. Intermediate leaf oil terpene compositions were found in several trees near the Continental Divide, indicating that there is a transition between these two varieties. Whereas the Black Hills and Wilkerson Pass samples had terpene compositions that were similar to trees from eastern Montana those from the Grand Canyon area differed quantitatively, indicating that a bridge to the southern variety *arizona* may be found in the leaf oil composition as well.

Ethnomedicine

9301-0515 Abbas, J.A., El-Oqlah, A.A., Mahashen, A.M. (Department of Biological Sciences, College of Science, University of Bahrain, P.O.Box 32038, Bahrain) **Herbal plants in the traditional medicine of Bahrain.** *Economic Botany*, v. 46(2): p. 158-163, 1992 (10 ref, Eng).

Plant samples collected in Bahrain and data reported in the literature indicate the flora of Bahrain to contain 52 species (49 genera; 20 families) of medicinal interest. Of these plant species 20 appear to be indigenous and are being used in traditional herbal remedies for numerous afflictions. Preparation of such remedies appears to be simple and includes boiling, infusions, extraction of milled dry or fresh leaves, flowers, seeds or whole plants. Direct consumption of plant parts, raw or cooked, is also practiced. None of these plants have been studied systematically to evaluate their medicinal potential.

9301-0516 Alam, M.K. (The New York Botanical Garden, Bronx, NY 10458, USA) **Medical ethnobotany of the Marma tribe of Bangladesh.** *Economic Botany*, v. 46(3): p. 330-335, 1992 (25 ref, Eng).

The three hill districts of Bangladesh (Khagrachari Rangamati and Bandarban) are inhabited by the people of 13 tribes. Marmas also known as Mughhs are Buddhists and are scattered over the three districts. Notes on medicinal uses of plants employed by the Marmas are recorded. Species are arranged alphabetically under each family. Latin names are followed by Marma names. Statement about the medicinal uses and voucher numbers are recorded.

9301-0517 Austin, D.F., Bourne, G.R. (Department of Biological Sciences, Florida Atlantic University, Boca Raton, FL 33431, USA) **Notes on Guyana's Medical Ethnobotany.** *Economic Botany*, v. 46(3): p. 293-298, 1992 (23 ref, Eng).

Traditional medicinal plantlore and its supporting plant species are disappearing at alarming rates. This loss comes at a time when ethnobotanists and biochemists are again beginning to screen plants for active compounds that are effective against many human afflictions. A "bush lady" and two other Guyanese knowledgeable in plant uses for treating human ailments were interviewed. The interviews produced a list of 55 plants. The common and scientific names of these plants with descriptions of their uses, cross-references to other vernacular names and uses in the Caribbean and northern South America, and the locations of voucher specimens for 46 of the 55 species, have been provided.

9301-0518 Bhatt, K.C., Bist, M.K., Gaur, R.D. (Department of Botany, University of Garhwal, Srinagar Garhwal 246 174, UP, India) **Flavouring and masticatory plants: A case study of Bhotias.** *Journal of Economic and Taxonomic Botany*, v. 15(1): p. 41-45, 1991 (10 ref, Eng).

Twenty plant species used by Bhotias, the nomadic tribes of Garhwal Himalaya for flavouring and masticatory purposes have been enlisted.

9301-0519 Bhattarai, N.K. (National Herbarium and Plant Laboratories, Department of Forestry and Plant Research, GPO Box 938, Kathmandu, Nepal) **Medical ethnobotany in the Karnali Zone, Nepal.** *Economic Botany*, v. 46(3): p. 257-261, 1992 (Eng).

The traditional phytotherapy of the lay population of Jumla, Mugu and Kalikot districts of Karnali Zone, West Nepal, has been investigated. Information on 80 empirically accepted prescriptions involving 62 plant species are presented along with details on uses. These herbal remedies are used to treat a wide spectrum of ailments. In most of the cases, these remedies appeared to be the only available source of treatment.

9301-0520 Brandao, M.G.L., Grandi, T.S.M., Rocha, E.M.M., Sawyer, D.R., Krettli, A.U. (Laboratoria de Farmacognosia, Faculdade de Farmacia, Universidade Federal de Minas Gerais (UFMG),* AV. Olegario Maciet 2360, 30180, Belo Horizonte, Brazil) **Survey of medicinal plants used as antimalarials in the Amazon.** *Journal of Ethnopharmacology*, v. 36(2): p. 175-183, 1992 (16 ref, Eng).

Plants traditionally employed for the treatment of malaria in certain areas of Brazil, where this disease is prevalent were surveyed by interviewing natives and migrants in the Amazon Region. Forty one plants used for malarial treatment and /or for the related symptoms fever and liver disorders were collected and identified. Given the potential of Brazil's forests and medicinal plants, research on traditional plants based remedies in Brazil may lead to development of new drugs.

9301-0521 Coimbra Teixeira, C., Danni Fuchs, F., Blotta, R.M., Pereira Da Costa, A., Guedes Mussnich, D., Graf Ranquetat, G. (Departamento de Farmacologia, Instituto de Biociencias, U.F.R.G.S., Rua Sarmento Leite, 500 90050, Porto Alegre, RS, Brazil) **Plants employed in the treatment of diabetes mellitus: results of an ethnopharmacological survey in Porto Alegre, Brazil.** *Fitoterapia*, v. 63(4): p. 320-322, 1992 (10 ref, Eng).

An ethnopharmacological survey conducted in Porto Alegre, Brazil revealed that the majority of people employ alternative medicines for their ailments. The most frequent-

ly used plant is "jambolao" (jambolan, malak rose-apple, malabar plum in English), botanically identified as *Syzygium ecumini* and *S.jambos*. Most of the people interviewed prepared the tea either by infusion or decoction from dry leaves of either species, in an average dilution of 2.5 g/l (0.2 to 8.0)..

9301-0522 De Feo, V., Aquino, R., Menghini, A., Ramundo, E., Senatore, F. (Dipartimento di Chimica delle Sostanze Naturali dell'Università di Napoli, Via Domenico Montesano, 49 80131, Napoli, Italy) **Traditional phytotherapy in Peninsula Sorrentina, Campania, Southern Italy.** *Journal of Ethnopharmacology*, v. 36(2): p. 113-125, 1992 (23 ref, Eng).

Wild and cultivated plants used in the Peninsula Sorrentina are reported. 129 plants belonging to 53 different families of Pteridophytes, Gymnosperms and Angiosperms are used in the treatment of various human diseases. The use of some species is reported for the first time especially medicinal use of three plants viz., *Alyssum saxatile* as a cicatrizant in case of urinary and gastric ulcers and as a sealant and an antiseptic, *Diplotaxis tenuifolia* as an aphrodisiac, *Hypericum perforatum* to treat burns as a skin reconstituent.

9301-0523 De Feo, V., Ambrosio, C., Senatore, F. (Dipartimento di Chimica delle Sostanze Naturali, Università degli Studi "Federico II", via D. Montesano 49, 80131 Napoli, Italy) **Traditional phytotherapy in Caserta province, Campania, southern Italy.** *Fitoterapia*, v. 63(4): p. 337-349, 1992 (23 ref, Eng).

The data of a survey on the wild and cultivated medicinal plants used in folk medicine in Caserta province is presented. 100 species belonging to 48 families are used, some of them unknown in traditional Italian phytotherapy. The plant species are tabulated. For each plant species, the common names (whenever available), formulations and therapeutic prescriptions are reported.

9301-0524 Gottesfeld, L.M.J. (Department of Anthropology, University of Alberta, Edmonton, Alberta, Canada T6G 2H4) **The Importance of bark products in the aboriginal economies of northwestern British Columbia, Canada.** *Economic Botany*, v. 46(2): p. 148-157, 1992 (47 ref, Eng).

In the coniferous forest dominated landscape of northwestern British Columbia, bark products were used. Bark from woody shrubs and trees was used for carbohydrate food, medicine etc. Use of the bark of twenty one species of woody plants is documented for the Gitksan, Wet'suwet'en and Haisla peoples of Northwest British

Columbia. Sixteen plant species are used for medicinal purposes.

9301-0525 Groves, M.J., Bisset, N.G. (Department of Pharmacology, College of Pharmacy, University of Illinois at Chicago (M/C 880), 833 South Wood Street, Chicago, IL 60612, USA) **A note on the use of topical Digitalis prior to William Withering.** *Journal of Ethnopharmacology*, v. 35(2): p. 99-103, 1991 (29 ref, Eng).

Attention is called to the fact that, long before the systematization of oral digitalis therapy by Withering in the eighteenth century, the drug was applied to the skin by induction, producing effects that can now be recognized as due to an overdosage of *Digitalis* glycosides. The history of digitalis is briefly reviewed: the drug appears not to have been known to Greek and Roman physicians, but by the Middle Ages was widely used in folk medicine. Contrary to current wisdom, there is a wealth of historical information suggesting that topically applied *Digitalis* glycosides are capable of exerting physiological activity. It is perhaps time to re-examine this feature, in view of the present-day general interest in transdermal medications.

9301-0526 Haji Mohiddin, M.Y.B., Chin, W., Holdsworth, D. (Department of Agriculture, Bandar Seri Begawan, Brunei Darussalam) **Traditional medicinal plants of Brunei Darussalam Part III. Sengkurong.** *International Journal of Pharmacognosy*, v. 30(2): p. 105-108, 1992 (17 ref, Eng).

A study of medicinal plants used by the Kadayan Malays who occupy the Sengkurong mukim (several kampongs, villages) 15 kilometers south-west of the capital, has been made and presented. Voucher specimens of the plants are stored at the Brunei herbarium and also at the Herbal Drug Museum, Kilanas Agricultural Research Centre. Plant name, family, local name, uses, chemical constituents are given.

9301-0527 Heinrich, M., Rimpler, H., Barrera, N.A. (Institut für Pharmazeutische Biologie, Albert Ludwigs Universität, Schanzlestr, 7800 Freiburg, FRG) **Indigenous phytotherapy of gastrointestinal disorders in a lowland Mixe community (Oaxaca, Mexico): Ethnopharmacological evaluation.** *Journal of Ethnopharmacology*, v. 36(1): p. 63-80, 1992 (125 ref, Eng).

Sixty five plants used by Mixe Indian community for gastrointestinal disorders and collected during a field study of 15 months are described and enumerated. According to indigenous criteria a plant is used in the treatment of certain illness because of its characteristic smell and taste. Plants with astringent properties are particularly valued to treat

diarrhoea and dysentery. Bitter and aromatic plants are employed to treat gastrointestinal cramps and pains. The efficacy to such plants was evaluated using ethnobotanical, phytochemical and pharmacologic information on the plants. The majority of the plants contain chemicals that may produce the effects desired by the Mixe. Frequently tannin containing drugs are used to treat diarrhoea and dysentery. A large number of the plants used by the Mixe contain essential oil or bitter principles. As a result of this plants should be studied phytochemically and pharmacologically with priority to evaluate. Further their potential in the treatment of gastrointestinal disorders.

9301-0528 Kapur, S.K.(Regional Research Laboratory, Canal Road, Jammu Tawi 180 001, JK, India) **Traditionally important medicinal plants of Dudu Valley-Jammu.** *Journal of Economic and Taxonomic Botany*, v. 15(1): p. 1-10, 1991 (5 ref, Eng).

Local names, plant description, phenology and medicinal uses of 78 plant species belonging to 71 genera and 46 families, used by the tribes of Dudu Valley have been reported.

9301-0529 Lewis, W.H.(Washington University, St. Louis, MO 63130, USA) **Early Uses of *Stevia rebaudiana* (Asteraceae) leaves as a sweetener in Paraguay.** *Economic Botany*, v. 46(3): p. 336-337, 1992 (10 ref, Eng).

Use of *S.rebaudiana* leaves as a sweetening agent by Guarani Paraguayan Indians, Mestizas and others has been reported as early as 1887. Subsequent references to its use both as a sweetener as well as for the treatment of diabetes have been recorded.

9301-0530 Lietava, J.(Medical Faculty Hospital, Medical Faculty of Comenius University, Mickiewiczova 13, Bratislava 813 69, Czechoslovakia) **Medicinal plants in a middle paleolithic grave Shanidar IV ?.** *Journal of Ethnopharmacology*, v. 35(3): p. 263-266, 1992 (29 ref, Eng).

Phytopharmacological evaluation of the therapeutic potential of the plants, found in the Neanderthal grave of a Shanidar IV individual (Iraq dating back to 60,000 B.C.), where by palynological analysis, flowers of *Achillea* type, *Senecio* type, *Muscari* type, *Althea* type, *Centaurea solstitialis* and *Ephedra altissima* were discovered, has been presented. Objective healing activity of the flowers and their considerable therapeutic effects have been suggested to be reason for their selection in Middle Paleolithic Shanidar Neanderthals.

9301-0531 Liu, C.X., Xia, P.G.(Tianjin Institute of Pharmaceutical Research, The State Pharmaceutical Administration of China 308 An-Shan West Road, Tianjin

300 019, People's Republic of China) **Recent advances on ginseng research in China.** *Journal of Ethnopharmacology*, v. 36(1): p. 27-38, 1992 (57 ref, Eng).

The review summarises some achievements from the research paper published during last 10 year in China. 28 ginsenosides and some minor constituents were extracted and isolated from the root, root stock, stem leaves, flowers and flower buds of ginseng. The chemical analysis demonstrated that the content of ginsenosides is related to the source part and growth years of ginseng. The drug has a wide range of pharmacological and therapeutical actions; it acts on the central nervous system, cardiovascular system and endocrine secretion, promotes immune function and metabolism, possesses biomodulation action; anti stress, antiaging activities etc. Several ginseng preparations have been officially approved for clinical application in China.

9301-0532 Morton, J.F.(Morton Collectanea, University of Miami, PO Box 8204, Coral Gables, Florida 33124, USA) **The ocean-going noni, or Indian mulberry (*Morinda citrifolia*, Rubiaceae) and some of its "Colourful" relatives.** *Economic Botany*, v. 46(3): p. 241-256, 1992 (110 ref, Eng).

The genus *Morinda* embraces about 80 species. The seeds of *M.citrifolia* and *M.royoe* have buoyant seeds which float for many months and have sundry folk-remedy uses. *M.parviflora* has antitumor/antileukemic activity. High intake of Selenium by *M.reticulata* has poisoned horses in Australia. Vernacular names of various species of *Morinda* in different countries as well as their medicinal uses have been listed.

9301-0533 Nagaraju, N., Rao, K.N.(Medicinal Plant Research Laboratory, Dept. of Botany, Sri Venkateswara University, Tirupati 571502, AP, India) **Folk medicine for diabetes from Rayalaseema of Andhra Pradesh.** *Ancient Science of Life*, v. 9(1): p. 31-35, 1989 (11 ref, Eng).

Folk-lore uses of 26 antidiabetic plant species occurring in Rayalaseema have been reported. The method of preparation and dose of administration of crude drugs as suggested by tribal and non-tribal herbalists are recorded. Also the known chemical constituent of these plants are reported.

9301-0534 Nistheswar, K.(Government Ayurvedic College, Vijayawada, AP, India) **Project profiles of herbal and traditional medicine based integrated health system in tribal areas of Andhra Pradesh.** *Indian Medicine*, v. 4(2): p. 2-6, 1992 (10 ref, Eng).

During the study conducted in the Chintapalli and Rampachodavaram tribal areas of India, using simple herbal recipes developed by integrating herbal and traditional

medical systems for various diseases like fever, cold and cough, skin disorders, anemia worm infestation aches constipation etc. Some herbal formulations compositions of which involves the use of locally available or growing medicinal plants are given along with traditional measurements and doses for adults, children, and infants. The local and botanical names of medicinal plants utilized in various recipes are also given.

9301-0535 Padhye, M.D., Deshmukh, V.K. , Tiwari, V.J.(Department of Botany, Nagpur University campus, Amravati Road, Nagpur, M.S., 440010, India) **Ethnobotanical study of the korku tribe of Amravati district, Maharashtra State, India.** *International Journal of Pharmacognosy*, v. 30(1): p. 17-20, 1992 (7 ref, Eng).

The korku are tribe inhabiting the forest areas of Melghat region of Amravati district. Ethnobotanical study of this tribe was undertaken thirteen plant species used by the tribe for medicinal purposes have been enumerated: plant name, family, local name, phytochemical data, uses, herbarium number have been included. Plant mentioned are *Biophytum sensitivum*, *Barringtonia acutangula*, *Dendrophylloë falcata*, *Ehretia laevis*, *Elephantopus scaber*, *Eulophia nuda*, *Geodorum dilatatum*, *Lanuea grandis*, *Leonotis nepetaefolia*, *Mecardonia procumbens*, *Oldenlandia nudicaulis*, *Rhincacanthus nasutus* and *Symphorema polyandra*.

9301-0536 Pushpangadan, P., Jeet Kaur, Sharma, J.(Regional Research Laboratory, Canal Road, Jammu 180001, JK, India) **Plantain or edible banana (*Musa x paradisica* var *sapientum*) some lesser known folk uses in India.** *Ancient Science of Life*, v. 9(1): p. 20-24, 1989 (3 ref, Eng).

Plantain or edible banana *M. X paradisica* var. *sapientum* fruits and other plant parts finds diverse uses in various folk practices, customs, religious rituals and medicines. In the present article uses of banana stem, fruits, roots and rhizomes leaf and leaf sheath and in medicines for treating common ailments are reported.

9301-0537 Russo, E.B.(Department of Neurology, Western Montana Clinic, Box 7609, 515 W.Front St., Missola, MT 59807, USA) **Headache treatment by native peoples of the ecuadorian amazon: a preliminary cross-disciplinary assessment.** *Journal of Ethnopharmacology*, v. 36(3): p. 193-206 , 1992 (39 ref, Eng).

Headache, specifically migraine, is an extremely frequent and debilitating syndrome with worldwide prevalence, including indigenous cultures of Amazonia. Headache as perceived within the medical philosophy of 5 Indian tribes of the Ecuadorian Amazon Basin is discussed.

Their ethnobotanical treatments for headache are examined, along with the limited available biochemical assay data. This information is analyzed by means of an Ethnopharmacology Rating Scale. suggestions are offered as to methods of biochemical analysis that may be fruitful in assessment of potential clinical headache remedies. Key among these is the screening of ethnobotanical samples for serotonin receptor activity. The potential may exist for the discovery of more effective, less toxic headache drugs, as well as for the development of a new industry for the local economy that could promote conservation of an endangered ecosystem.

9301-0538 Sadhale, A., Majumdar, A.M., Pendse, G.S.(Indian Drugs Research Association, 561-B, Shivajinagar, Pune 411 005, Maharashtra, India) **Ethnobotanical studies of sacred grove at Ajiwali Pune district.** *Journal of Economic and Taxonomic Botany*, v. 15(1): p. 167-172, 1991 (10 ref, Eng).

Medicinal uses of forty three plant species alongwith fifteen other useful plants of the sacred grove at Ajiwali have been enumerated.

9301-0539 Samuelsson, G., Farah, M.H. , Claeson, P., Hagos, M., Thulin, M. , Hedberg, O., Warfa, A.M., Hassan, A.O. , Elmi, A.H., Abdurahman, A.D., Elmi, A.S. , Abdi, Y.A., Alin, M.H.(Department of Pharmacognosy, Uppsala University, Uppsala Biomedicinal Centre, P.O. box 579, S-751 23 Uppsala Sweden) **Inventory of plants used in traditional medicine in Somalia. I. Plants of the families Acanthaceae-Chenopodiaceae.** *Journal of Ethnopharmacology*, v. 35(1): p. 25-63 , 1991 (324, Eng).

Thirty-eight plants are listed, which are used by traditional healers in the central and southern parts of Somalia. For each species are listed: the botanical name with synonyms, collection number, vernacular name, medicinal use, preparation of remedy and dosage. Results of a literature survey are also reported including medicinal use, substances isolated and pharmacological effects.

9301-0540 Sezik, E., Tabata, M., Yesilada, E. , Honda, G., Goto, K., Ikeshiro, Y. ("Gazi University, Faculty of Pharmacy, Department of Pharmacognosy, Ankara, Turkey) **Traditional medicine in Turkey I. Folk medicine in Northeast Anatolia.** *Journal of Ethnopharmacology*, v. 35(2); p. 191-196 , 1991 (8 ref, Eng).

Use of plants for folk medicine in Northeast Anatolia region of Turkey have been reported. Eighteen plant species with their vernacular names, family locality of plant occurrence, part used applications, medicinal uses and herbarium number, have been reported. Information was collected through direct contact and interviews with the rural people.

9301-0541 Sinha, R.K.(Indira Gandhi Centre for Human Ecology, Environmental and Population Studies, University of Rajasthan, Jaipur 302 004, India) **Herbal remedies prescribed by the street herbal vendors (mobile tribal medicine men) in the treatment of some common human ecological diseases in India (Gastro-intestinal disorders).** *Journal of Research and Education in Indian Medicine*, v. 11(1): p. 15-19, 1992 (8 ref, Eng).

The herbal vendors are the mobile tribal medicine men seen on the busy streets of many Indian cities selling crude medicinal plants and their products kept in glass jars on the roadsides. They have herbal remedies for several human diseases and ailments the knowledge about which they have inherited from their forefathers through several generations of experimentation and experience. A survey made in Delhi revealed that they have herbal remedies for several human ailments. Some of the plants and their products used in the treatment of gastro-intestinal ailments have been discussed.

9301-0542 Vander Nat, J.M., Vander Sluis, W.G., de Silva, K.T.D., Labadie, R.P.(Section of Pharmacognosy. Faculty of Pharmacology of Pharmacy University of Utrecht, Sorpounelaan 16, Post 80082, 3508 TB Utrecht, The Netherlands) **Ethnopharmacognostical survey of *Azadirachta indica* A.Juss (Meliaceae).** *Journal of Ethnopharmacology*, v. 35(1): p. 1-24, 1991 (155 ref, Eng).

Literature data on botany chemistry ethnopharmacology, pharmacology and toxicology of *A.indica* are reviewed and evaluated. In traditional literature, preparations of tree are claimed to be valuable in wide spectrum of diseases. Most frequently the biological activities are attributed to limonoids, phenolics and macromolecules. Reported toxicity of preparations and isolated compounds are low. *A.indica* can be regarded as a valuable plant source for rationalization of its use in traditional medicine and for modern drug development.

9301-0543 Veale, D.J.H., Furman, K.I., Oliver, D.W.(Department of Experimental and Clinical Pharmacology, University of the Witwatersrand, Johannesburg, S.Africa) **South African traditional herbal medicines used during pregnancy and childbirth.** *Journal of Ethnopharmacology*, v. 36(3): p. 185-191, 1992 (25 ref, Eng).

Many black South African women use traditional herbal remedies as antenatal medications or to induce or augment labour. Very little is known about the pharmacology and potential toxicity of the plants used in these herbal remedies. The ethnic background and traditional usage of these remedies was researched and a literature survey revealed that 57 different plants were used in herbal prepara-

tions during pregnancy and childbirth. Several of these plants are poisonous and details of their toxicity are given.

9301-0544 Vogel, H.G.(HOECHST AG, D-6230 Frankfurt/M80, F.R.G.) **Similarities between various systems of traditional medicine. Considerations for the future of ethnopharmacology.** *Journal of Ethnopharmacology*, v. 35(2): p. 179-190, 1991 (38 ref, Eng).

Traditional medicine using herbal drugs exists in every part of the world. The major areas are Chinese, Indian and European traditions. The philosophies of these traditional medicines have some resemblance to each other but differ widely from modern Western medicine. In view of the progress of Western medicine not only new synthetic drugs but also herbal drugs have to fulfill the international requirements on quality, safety and efficacy. Herbal drugs have the advantage of being available for patients in the geographical area of the special traditional medicine. The development procedure of herbal drugs for world-wide use has to be different from that of synthetic drugs.

Analytical & Processing Techniques

9301-0545 barbeni, M., Allegrone, G., Cisero, M., Guarda, P.A.(San Giorgio Flavors S p A via Fossata 114, 10147 Turin, Italy) **GC and NMR Enantiodiscrimination of 2-methyl substituted aliphatic acids via diastereomeric esterification with (R)-pantolactone.** *Flavour and Fragrance Journal*, v. 7(3): p. 163-167, 1992 (21 ref, Eng).

The chiral differentiation of the enantiomers of 2-methylbutanoic acid, 2-methylpentanoic acid and 2-methylhexanoic acid was achieved by diastereomeric derivatization with (R)-(-)-pantolactone. GC separation on achiral DB-1, DB-1701 and DB-WAX capillary columns as well as ¹H and ¹³C-NMR enantiodiscrimination were obtained, affording good resolution and quantitative evaluation of enantiomer composition. The method applied to 2-methylbutanoic acid present in the aromatic fraction extracted from cultivated strawberry (*Fragaria vesca*) indicated a high enantiomeric excess of the (S)-isomer.

9301-0546 Baykal, T., Ozilhan, S., Yliman, A.M.(Department of Pharmacognosy, Faculty of Pharmacy, Gazi University, 06330, Ankara, Turkey) **Determination of colchicine and its photo-isomer by HPLC.** *Journal of Faculty of Pharmacy, Gazi*, v. 9(1): p. 59-66, 1992 (9 ref, Eng).

Separation and determination of colchicine (from *Colchicum autumnale*) and its degradation product formed in presence of UV light have been carried out by HPLC. Reverse phase HPLC assay shows good reproducibility, sensitivity and selectivity. It is a simple, convenient and

rapid method, and can be used in response to clinical problem. This method can be used to determine the colchicine concentration as low as ng level in biological samples. PID, New Delhi.

9301-0547 Bi, K.S., Wang, X., Luo, X. (Shenyang College of Pharmacy, Shenyang 110051) **Quality assessment of ginseng by chemical fuzzy pattern recognition.** *Acta Pharmaceutica Sinica*, v. 27(1): p. 48-51, 1992 (11 ref, Eng, Chi).

Water and liquor extracts of ginseng *Panax ginseng* were prepared from 25 samples, and data reflecting its chemical constituents as a whole were obtained by ultraviolet and visible spectroscopy, HPLC and emission spectroscopy with inductively coupled plasma source. Pharmacological experiments with the extracts on mice were conducted and compared mutually and with those obtained on placebo treated ones. Based on the results, data were selected and fuzzy equations formulated were solved to ascertain the effective constituents with different weights and their compatibility. A correlation analysis was carried out and a new scheme for quality assessment of ginseng has been worked out.

9301-0548 Borejsza-Wysocki, W., Goers, S.K., McArdle, R.N., Hrazdina, G. (Institute of Food Science, Cornell University, Geneva, New York 14456, USA) **(p-Hydroxyphenyl)butan-2-one levels in raspberries determined by chromatographic and organoleptic methods.** *Journal of Agricultural and Food Chemistry*, v. 40(7): p. 1176-1177, 1992 (8 ref, Eng).

Different raspberry cultivars were analyzed by HPLC for (p-hydroxyphenyl)butan-2-one, the characteristic raspberry aroma component. Anthocyanin concentration, although 3 orders of magnitude higher, paralleled the (p-hydroxyphenyl)butan-2-one content of raspberry fruits of the same developmental stage with one exception. Organoleptic evaluation of the raspberry fruit was in agreement with increasing raspberry flavor and increasing (p-hydroxyphenyl)butan-2-one content of the fruits.

9301-0549 Charlton, T.S., Marini, A.M., Markey, S.P., Norstog, K., Duncan, M.W. (Biomedical Mass Spectrometry Unit, University of New South Wales, P O Box 1, Kensington, New South Wales 2033, Australia) **Quantification of the neurotoxin 2-amino-3-(methylamino)-propanoic acid (BMMA) in cycadales.** *Phytochemistry*, v. 31(10): p. 3429-3432, 1992 (17 ref, Eng).

The L-isomer of 2-amino-3-(methylamino)propanoic acid (BMAA; beta-methyldiaminopropanoic acid), a constituent of cycads, has recently been implicated in the onset

of human neurologic disorders. Use of combined gas chromatography-mass spectrometry (GC-MS) to determine the BMAA content of the leaves (n=30) and female gametophyte (n=11) of a variety of cycads has been described. BMAA content is greater in members of the genus *Cycas* (i.e. up to 1800 microg/g fresh weight) whereas smaller amounts (i.e. (microg/g are present in members of the six other genera tested. Where BMAA content of both leaves and seeds was determined in the same species (n=4), values were comparable. The results estimate that grazing animals are exposed to exceedingly low doses of BMAA.

9301-0550 Cotroneo, A., d'Alcontres, I.S., Trozzi, A. (Dipartimento Farmaco-chimico, Facolta di Farmacia, University di Messina 98168 Messina, Italy) **On the genuineness of citrus essential oils. Part XXXIV. Detection of added reconstituted bergamot oil in genuine bergamot essential oil by high resolution gas chromatography with chiral capillary columns.** *Flavour and Fragrance Journal*, v. 7(1): p. 15-17, 1992 (8 ref, Eng).

A rapid method for the detection of the addition of reconstituted bergamot oils to natural bergamot essential oils has been suggested. The method is based on the ratio of the two enantiomers of linalol determined by gas chromatography with chiral capillary columns.

9301-0551 Crouch, R.C., Martin, G.E. (Division of Organic Chemistry, Burroughs Wellcome Co., Research Triangle Park, NC 27709, USA) **Micro inverse-detection: a powerful technique for natural product structure elucidation.** *Journal of Natural Products*, v. 55(9): p. 1343-1347, 1992 (12 ref, Eng).

Sample quantities required for heteronuclear correlation spectra are significantly reduced when the experiments are performed in a micro-inverse detection probe. The method to acquire high quality HMQC and HMBC spectra on very small samples of natural product material, coupled with proton-proton connectivities from a COSY spectrum has been described.

9301-0552 Dwivedi, A.K., Jayanthi, L., Chaudary, M., Sarin, J.P.S. (Pharmaceutics Division, Central Drug Research Institute, Lucknow 226001, UP, India) **Combined thin layer chromatography-densitometry for the quantitation of picroside and kuthoside in picroliv.** *Indian Journal of Pharmaceutical Sciences*, v. 54(5): p. 189-191, 1992 (6 ref, Eng).

a simple TLC densitometric estimation method for picroside-L and kutkoside in Picroliv are in its dosage forms, is described. The assay combines adsorption of Picroliv obtained from the alcoholic extract of roots of *Picrorhiza kurroa* on silica gel 60 F254 plate and thin layer

chromatography with spot visualization by spraying plate with ceric sulphate (1 percent solution in 2N H₂SO₄) and densitometry by absorption mode. The method is simple and can be utilized to estimate five or more samples at the same time.

9301-0553 Dwivedi, A.K., Raman, M., Seth, R.K., Sarin, J.P.S. (Division of Pharmaceutics, Central Drug Research Institute, Lucknow 226001, UP, India) **Combined thin-layer chromatography-densitometry for the quantitation of curcumin in pharmaceutical dosage forms and in serum.** *Indian Journal of Pharmaceutical Sciences*, v. 54(5): p. 174-177, 1992 (3 ref, Eng).

A new TLC densitometric method for the quantitative estimation of the nonsteroidal antiinflammatory agent curcumin (isolated from the rhizomes of *Curcuma longa*) in bulk drug samples, pharmaceutical dosage forms and in human serum has been described. The assay combines TLC on silicagel 60 F254 with spot visualization by single wavelength reflection mode, excitation 265nm and emission uv D2 filter and densitometry.

9301-0554 Fang, H.J., Cheng, K.D., Xu, Y.Q. (Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100 050, China) **Studies on analysis of Belladonna alkaloids by capillary GC and GC-MSD.** *Acta Pharmaceutica Sinica*, v. 27(3): p. 220-226, 1992 (10 ref, Chi, Eng).

A method for analyzing belladonna *Atropa belladonna* alkaloids - hyoscyamine, scopolamine, anisodamine and anisodine, by means of capillary GC and GC-MSD was described. The retention data and characteristic ions of the parent and TMS derivatives of these alkaloids are given and will be very useful for identification of unknown alkaloids. The derivatization of different silylation reagents was compared, and the derivatization with MSTFA was found to be better than with BSA and BSTFA. The method has been used for studying biotransformation of these alkaloids in biosynthesis. Analysis of anisodamine and anisodine by CGC and GC-MS has not been found in the literature. In addition, the advantages of TMS derivatization are also discussed.

9301-0555 Ikeda, Y., Fujii, Y.*, Yamazaki, M. (School of Pharmacy, Hokuriku University, 3 Ho, Kanagawa-Machi, Kanazawa 920-11, Japan) **Determination of lanatoside C and digoxin in Digitalis lanata by HPLC and its application to analysis of the fermented leaf powder.** *Journal of Natural Products*, v. 55(6): p. 748-752, 1992 (20 ref, Eng).

A quantitative HPLC method for the simultaneous determination of lanatoside C and digoxin in *D. lanata* was developed. The extract of dry leaf powder with 50 percent

MeOH was applied to a Sep-Pak C18 cartridge prior to HPLC analysis. The analysis was performed on an octylsilyl bonded silica column, using MeCN-MeOH-H₂O (20:1:50) and UV detection (220 nm). The quantitation was carried out by the internal standard method. The proposed method is sufficiently precise and relatively simple. Application of this HPLC analysis to the determination of lanatoside C and digoxin after fermentation of the leaf powder is also described.

9301-0556 Ishihara, S., Ushikawa, T., Yoshida, S., Tosa, S., Nakazawa, H., Tomimatsu, T. (Tokushima Perf. Institute for Pharmacy, 3-80, Shinkara-cho, Tokushima 770, Japan) **Studies of essential oils in Citrus (1). Analysis of limonene in Citrus unshiu peel by high performance liquid chromatography.** *Shoyakugaku Zasshi*, v. 46(2): p. 125-130, 1992 (6 ref, Eng, Jap).

The effect of storage time on limonene contents in 14 kinds of *C. unshiu* peel was investigated by HPLC using a shim-pack CLC-ODS column with methanol-acetonitrile water (70:5:25) as the mobile phase and detection at 215 nm. The effect of drying on the decrease in limonene content was less when the size of the crude drugs was large. Drying with hot air at 60 degree C was preferable. Storage at 15 degree C was better than the storage at room temperature. Storage at room temperature for one year was possible if the peel had been blanched in boiling water for one minute before drying.

9301-0557 Karl, V., Schumacher, K., Mosandl, A. (Institut für Lebensmittelchemie, Johann Wolfgang Goethe-Universität, Frankfurt, Robert-Mayer-Str. 7-9, D-6000 Frankfurt/Main, Germany) **Enantiomeric 2-methylbutanoates: Sensory evaluation and chirospecific analysis.** *Flavour and Fragrance Journal*, v. 7(5): p. 283-288, 1992 (20 ref, Eng).

Phenolic 2-methylbutanoates are known to be characteristic components of various essential oils, but their optical purity is not known. Enantiomeric pseudoisoeugenyl 2-methylbutanoates have been synthesized and their sensory properties were found to depend on the optical and geometrical isomerism of the components investigated. Furthermore, (S)-2-methylbutanoates have been detected as the genuine esters from *Pimpinella anisum*, *Arnica* (unknown species) and *Pimpinella saxifraga*, using ester hydrolysis and subsequent enantioselective MDGC analysis of the corresponding 2-methylbutanoic acid.

9301-0558 Kreis, P., Mosandl, A. (Institut für Lebensmittelchemie, Johann Wolfgang Goethe-Universität, Robert-Mayer-Strasse 7-9, D-6000 Frankfurt/Main 11, Germany) **Chiral compounds of essential oils. Part XI. Simultaneous stereoanalysis of Lavandula oil con-**

stituents. *Flavour and Fragrance Journal*, v. 7(4): p. 187-193, 1992 (28 ref, Eng).

Enantioselective multidimensional gas chromatography using the column combination Carbowax 20 M/heptakis (2,3-di-O-acetyl-6-O-tert-butyldimethylsilyl)-beta-cyclodextrin in OV 1701-vinyl allows the simultaneous stereodifferentiation of trans- and cis-linalol oxides (furanoid), camphor, octan-3-ol, oct-1-en-3-ol, linalyl acetate, lavandulol, terpinen-4-ol and linalol. The method is applied to commercially available as well as self-prepared essential oils of *Lavandula species*. Chirality evaluation is discussed in view of quality assessment of these essential oils.

9301-0559 Kreis, P., Mosandl, A. (Institut für Lebensmittelchemie, Johann Wolfgang Goethe-Universität, Robert-Mayer-Strasse 7-9, D-6000 Frankfurt/Main 11, Germany) **Chiral compounds of essential oils. Part XII. Authenticity control of rose oils, using enantioselective multidimensional gas chromatography.** *Flavour and Fragrance Journal*, v. 7(4): p. 199-203, 1992 (21 ref, Eng).

Linalol, citronellol, cis/trans rose oxides and carvone are widespread natural fragrance compounds and well known among the genuine constituents of rose oils. Using enantioselective multidimensional gas chromatography (enantio-MDGC) and the column combination Carbowax 20 M/heptakis(2,3-di-O-acetyl-6-O-tert-butyldimethylsilyl)-beta-cyclodextrin in OV 1701-vi the direct and simultaneous stereoanalysis of these chiral fragrance compounds is achieved. The method is applied to the chirality evaluation of cis/trans rose oxides, linalol and citronellol from authentic Bulgarian and Turkish rose oils as well as commercially available rose oils. The enantiomeric ratios of genuine constituents from rose oils are discussed as indicators of naturalness.

9301-0560 Lescano, G., Narvaiz, P., Kairiyama, E. (Comisión Nacional de Energía Atómica Gerencia de Área Radioisótopos y Radiaciones (1842) Agencia Minipost-Centro Atómico Ezeiza, Buenos Aires, Argentina) **Sterilization of spices and vegetable seasoning by gamma radiation.** *Acta Alimentaria*, v. 20(3-4): p. 233-242, 1991 (24 ref, Eng).

The pH values of water extracts of ginger, turmeric, cayenne pepper, onion and garlic powders appear practically unchanged by the applied gamma radiation doses 10 and 30 KGY. Gas-chromatographic patterns of ginger (volatile oil and oleoresins) and Cayenne pepper (volatile oil) in control and irradiated samples were observed in irradiated samples, in general, without significant differences. Spectrophotometric analysis of methyl alcohol extraction of the pigments showed no irradiation effect in turmeric and

ginger. Colour loss was observed in Cayenne pepper and onion powder, proportional to radiation dose soon after irradiation; differences between control and irradiated samples became lower at the end of the storage period. Seasoning capacity (odour, flavour and pungency) were not altered by 30 kGy. Colour was perceived as different in ginger and Cayenne pepper (slightly lighter), and in onion and garlic powders (slightly darker), but not in turmeric, which is used to give colour.

9301-0561 Li, J., Tong, Y.Y. (Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100050, China) **Determination of active constituents in Shi-Wei (Folium pyrrosiae) by high performance liquid chromatography.** *Acta Pharmaceutica Sinica*, v. 27(2): p. 153-156, 1992 (7 ref, Chi, Eng).

A new, quick and sensitive analytical method for the simultaneous determination of three constituents viz; mangiferin, isomangiferin and chlorogenic acid in Folium Pyrrosiae (Shi-Wei) using HPLC was developed. The constituents in crude drugs were completely separated within 15 min and their recoveries were 96.78-101.3 percent with coefficients of variations 1.8-4.7 percent. Mangiferin and isomangiferin were separated for the first time. Using new method 7 species of *Pyrrosia* collected from 17 districts were analysed.

9301-0562 Moriyasu, M., Ichimaru, M., Sawada, Y., Izutshu, K., Nishiyama, Y., Kato, A. (Kobe Women's College of Pharmacy, Motoyamakitamachi, Higashinada-ku, Kobe 658, Japan) **Analysis of alkaloids in Nandina domestica by means of HPLC and TLC densitometry.** *Shoyakugaku Zasshi*, v. 46(2): p. 143-149, 1992 (15 ref, Eng).

In HPLC analysis, both photodiode-array detector and LC-MS were utilized. The ion pair HPLC system gives separation by an isocratic elution system, and in the ion suppression HPLC system using a gradient elution system containing ammonium acetate, LC-MS is possible, which is not possible with the former. Tertiary and quaternary bases were also separated on silica gel HPTLC plates. TLC-densitometry was successfully used for both identification and estimation of quantities. The nantenine and protopine contents in commercial nandinae fructus were determined by ion-pair HPLC and TLC densitometry and results were compared. In addition to the alkaloids already known, pseudocolumbamine was obtained from the stems; pseudoberberines have not been isolated from the plant before.

9301-0563 Niu, C.Q., He, L.Y. (Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing, China) **HPTLC separation and fluorodensitometric determina-**

tion of isoquinoline alkaloids in *Chelidonium majus* L.. *Acta Pharmaceutica Sinica*, v. 27(1): p. 69-73, 1992 (4 ref, Eng, Chi).

Using HPTLC method, eight isoquinoline alkaloids were isolated from *C.majus*/. After separation of alkaloids fluorescence derivatization was carried out in situ. The content were determined by fluorescence scanning. TLC fluorescence derivatization, fluorescence enhancement and fluorescence stability have been studied.

9301-0564 Ravid, U., Putievsky, E., Katzir, I., Ikan, R. (Department of Medicinal, Spice and Aromatic Plants, Agricultural Research organization, Newe Ya'ar, Haifa Post 31-999, Israel) **Determination of the enantiomeric composition of terpinen-4-ol in essential oils using a permethylated beta-cyclodextrin coated chiral capillary column.** *Flavour and Fragrance Journal*, v. 7(1): p. 49-52, 1992 (23 ref, Eng).

The enantiomeric composition and relative quantity of terpinen-4-ol was determined in laboratory made essential oils and in essential oils and samples of terpinene-4-ol from commercial sources using a permethylated-beta-cyclodextrin-coated chiral capillary column. Chromatographic enantiomeric resolution of terpinen-4-ol was achieved by injection of a purified fraction collected by preparative gas chromatography. (S)-(+)-Terpinen-4-ol with high enantiomeric purity was detected in three lavender oils of different origin.

9301-0565 Ravid, U., Putievsky, E., Katzir, I., Ikan, R. (Institute of Field Crops, Agricultural Research Organization, Newe Ya'ar, Haifa Post 31-999, Israel) **Chiral GC analysis of enantiomerically pure fenchone in essential oils.** *Flavour and Fragrance Journal*, v. 7(3): p. 169-172, 1992 (23 ref, Eng).

Enantiomerically pure(+)-fenchone was detected in the essential oils of wild, bitter and sweet fennel plants and seeds. Enantiomerically pure(-)-fenchone was detected in the oils of wormwood, tansy and cedarleaf. Determination of the enantiomeric purity of fenchone in laboratory-made essential oils and in essential oils and samples of fenchone from commercial sources, was performed by direct capillary gas chromatography.

9301-0566 Ravid, U., Putievsky, E., Katzir, I., Ikan, R., Weinstein, V. (Institute of Field Crops, Agricultural Research Organization, Newe Ya'ar, Haifa Post 31-999, Israel) **Determination of the enantiomeric composition of citronellol in essential oils by chiral GC analysis on a modified gamma-cyclodextrin phase.** *Flavour and Fragrance Journal*, v. 7(4): p. 235-238, 1992 (19 ref, Eng).

The enantiomeric composition of citronellol (tri-fluoroacetyl derivative) was determined on a commercially available fused-silica chiral capillary column, Lipodex E. Laboratory-made geranium Bourbon oils yielded higher enantiomeric excesses of (-)-citronellol than commercial Bourbon oils, and Egyptian-type oils. In addition high enantiomeric excesses of (-)-citronellol from rose oil and (+)-citronellol from citronella oil were detected.

9301-0567 Ravid, U., Putievsky, E., Katzir, I., Weinstein, v., Ikan, R. (Institute of Field Crops, Agricultural Research Organization, Newe ya'ar, Haifa Post 31-999, Israel) **Chiral GC analysis of (S)(+)-and (R)(-)-carvone with high enantiomeric purity in caraway, dill and spearmint oils.** *Flavour and Fragrance Journal*, v. 7(5): p. 289-292, 1992 (18 ref, Eng).

(S)(+)-Carvone with high enantiomeric purity was detected in the seed and herb oils of caraway (*Carum carvi*) and dill (*Anethum graveolens*). High enantiometric purity of (R)(-)-carvone was detected in the oils of spearmint (*Mentha spicata*) from various sources. Direct enantiomer separation of carvone from essential oils and synthetic samples was performed using Lipodex E as a chiral gamma-cyclodextrin stationary phase.

9301-0568 Schmidt, P.C., Soyke, B. (Pharmazeutisches Institut der Eberhard-Karls-Universitat Tübingen, Lehrstuhl für Pharmazeutische Technologie, Auf der Morgenstelle 8, D-7400 Tübingen, FRG) **Development of a matricine containing chamomile preparation. 1st Communication: Harvesting, drying, storage, stability and extraction of chamomile flowers.** *Scientia Pharmaceutica*, v. 60(1-2): p. 111-123, 1992 (26 ref, Eng, Ger).

Fresh *Matricaria recutita* syn. *Chamomilla recutita* flowers are stored in aluminium bags at -20 degree C until they are processed. There is no decomposition of matricine detectable under these storage conditions. The air-dried flowers contain about 39 to 45 percent less matricine than fresh chamomile. In contrast, carefully freeze-dried flowers only lose 4 to 28 percent of their matricine. The extraction of chamomile flowers with solvents of different polarity reveals a high yield of matricine for semi-polar solvents. For further investigations ethylacetate was chosen due to its toxicological and technological properties. A high content of matricine is detectable after a short time kinetic-maceration and does not change during the whole extraction-time of 8 hours. A nearly exhaustive percolation of chamomile flowers is done by yielding 6 part percolates (where 1 part of percolate corresponds to 1 part of drug). After percolation of matricine a water- or water-alcoholic-extraction may follow to extract the hydrophilic compounds.

9301-0569 Shin, K.H., Kong, S.S., Chi Hyung-Joon (Natural Products Research Institute, Seoul National University, Seoul 110 460, Korea) **Analysis of the coumarin constituents in *Peucedanii radix*.** *Korean Journal of Pharmacognosy*, v. 23(1): p. 20-23, 1992 (8 ref, Eng, Kor).

A new method for the analysis of coumarin constituents in the roots of *P.japonicum* by HPLC was established. Among two coumarin constituents identified, peucedanol was confirmed to be applicable to a standard compound. A reversal phase system with an micro Bondapak C18 column using H₂O-MeOH=5:4 as a mobile phase was developed. Peucedanol and a minor constituent, umbelliferone were detected at 333 nm and the analysis was carried out within 20 min.

9301-0570 Varadi, M., Hruschka, W., Norris, K.H. (Central Food Research Institute, H-1022 Budapest, Herman Otto ut 15, Hungary) **Investigation into the applicability of diffuse reflectance and transmittance technology to tobacco analysis.** *Acta Alimentaria*, v. 21(2): p. 95-106, 1992 (9 ref, Eng).

On the basis of results obtained in the 1100-2500 nm and 400-1100 nm region using the reflectance and transmission techniques, it has been established that the highest correlation coefficient and the lowest standard error of calibration can be achieved in the 1000-2500 nm region at reflectance mode. It was possible to determine total alkaloids content within a standard error of calibration of (+-)0.99 percent, the tar content within (+-)0.63 mass percent and the reducing sugar content within (+-)1.099 mass percent. NIR technique ensures satisfactory accuracy for determination of total alkaloids and reducing sugar in Hungarian varieties of tobacco.

9301-0571 Wu, Y.X., Xu, L.X. (Institute of Materia Medica, Chinese Academy of Sciences, Beijing 100050, China) **Analysis of isoflavones in *Belamcanda Chinensis* (I) DC and *Iris tectorum maxim* by squarewave voltametry.** *Acta Pharmaceutica Sinica*, v. 27(1): p. 64-68, 1992 (3 ref, Eng, Chi).

Three isoflavones irigenin tectorigenin and tectoridin in *B.chinensis* and *I.tectorum* were determined at the potential of 1.34 v/ (vs Ag/AgCl). The isoflavones gave well defined peaks in the buffer solutions of pH3-5. A linear relationship was obtained between the peak current and concentration. The method can be used to analyse small amounts of sample.

9301-0572 Yilman, M.A., Ozilhan, S., Nazaroghi, N., Sener, B. (Narcotics Laboratory, Gendarmerie General Comandry 06100, Ankara, Turkey) **Analysis of illicit**

heroin samples by HPLC. *Journal of Faculty of Pharmacy, Gazi*, v. 8(2): p. 71-80, 1991 (32 ref, Eng).

A convenient procedure to analyse heroin basic impurities by means of HPLC has been described. Reverse phase HPLC is used for the determination of heroin in combination with morphine, codeine, O-monoacetylmorphine, acetyl codeine, narcotine and papaverine in illicit market preparations. This method is sensitive, accurate, reproducible and enables the analyst to detect other drugs in the presence of heroin.

9301-0573 Yoshiyaki, F., Nakayawa, J., Ando, T., Hisamichi, S. (Tohoku College of Pharmacy, 4-4-1 Komat-sushima, Aoba-ku, Sendai 981, Japan) **Simplified determination of sugetriol triacetate in *Cyperi rhizoma*.** *Shoyakugaku Zasshi*, v. 46(2): p. 187-189, 1992 (6 ref, Eng).

A simple gas-liquid chromatographic method of determination of the sugetriol triacetate content in *Cyperi(cyperus)rhizome* was established, in which a Silicone SE-30 column and acetone extration solvent was employed. The content was estimated on the basis of the peak area. The sugetriol triacetate contents in commercially available cyperi rhizoma samples were determined.

9301-0574 Yu, D.Q., Xie, F.Z., He, W.Y., Liang, X.T. (Institute of Materia Medica, Chinese Academy of Medical Sciences, Beijing 100 050, China) **Application of 2D NMR techniques in the structure determination of chrysanthetriol.** *Acta Pharmaceutica Sinica*, v. 27(3): p. 191-196, 1992 (2 ref, Chi, Eng).

A new sesquiterpene compound, named chrysanthetriol was isolated from the more polar fraction of the *Chrysanthemum indicum*, a Chinese traditional drug. Chrysanthetriol is a colorless oil, {alpha}20D-31.8 degree(C 0.3, MeOH). HRMS showed the molecular formula to be C₁₅H₂₆O₃. The structure and stereochemistry of chrysanthetriol was elucidated by the use of 1H-1H COSY, 1H - 13C COSY, 1H-13C COLOC 2D NMR spectroscopy.

Miscellaneous

9301-0575 Balacs, T. (P.O.Box 746, Hove, E.Sussex, BN3 3XA, England) **Research reports.** *International Journal of Aromatherapy*, v. 4(3): p. 31-33, 1992 (8 ref, Eng).

Uses of essential oils as antimicrobial agents, in gums protection, heart disease, brain wave response, antiinflammatory and as sedatives have been reported. The oils used are nigella, patchouli, nutmeg, citronellal, neroli, clove, rose, melissa and geranium.

9301-0576 Barbora, B.C., Choudhury, D.M.N. (Tocklai Experimental Station, Tea Research Association, Jorhat 785008, Assam, India) **Nutritional and medicinal values of tea (*Camellia sinensis*)**. *Journal of Biological Science Society of North East India*, v. 1(1): p. 1-5, 1991 (23 ref, Eng).

The polyphenols (catechins) are found to be anticarcinogenic and antimutagenic. Green tea catechins have profound effect on the lipid metabolism. Tea catechins reduced serum cholesterol level. Tea caffeine and/or catechins improve the conditions of atherosclerosis patients. Tea can provide some amount of essential minerals amino acids, and vitamins. Tea pigments can be used as food additives. NSL, New Delhi.

9301-0577 Bedoukian, P. (Bedaukian Research, Inc., Finance Derive, Danbury CT 06810, USA) **Bouquet a la Marechale: An early fragrance**. *Perfumer & Flavorist*, v. 17(5): p. 43-46, 1992 (9 ref, Eng).

Various formulaions of bouquet a la Marechale used since 1777 have been described. Bouquet a la Marechale enjoyed its popularity for two and a half centuries, until about 1925 when references to it ceased to appear in the literature. It was an intriguing fragrance.

9301-0578 Bellakhdar, J., Claisse, R., Fleurentin, J., Younos, C. (Pharmacien Chercheur, Association Al Biruniya, BP 6303, Rabat (Morocco)) **Repertory of standard herbal drugs in the Moroccan pharmacopoea**. *Journal of Ethnopharmacology*, v. 35(2): p. 123-143, 1991 (23 ref, Eng).

The traditional uses of plants for medicine were studied in Morocco. To this date, 231 medicinal plants belonging commonly to the Moroccan pharmacopoea have been identified and are presented in a table with the vernacular name in Arabic and / or Berbe, the ecological distribution, the useful part and the medicinal use. The study of the main therapeutic indications of the medicinal plants gives a clear picture of the health problems which are treated by traditional medicine in Morocco.

9301-0579 Bisset, N.G. (Pharmacognosy Research Laboratories, Chelsea Department of Pharmacy, Kings College London, University of London, Manresa Road, London SW 36LX, UK) **War and hunting poisons of the New World, Part 1. Notes on the early history of curare**. *Journal of Ethnopharmacology*, v. 36(1): p. 1-26, 1992 (108 ref, Eng).

The history from 1548 to about 1850 of the muscle relaxant poison curare is discussed especially the development leading to the botanical identification of the plants that yield the alkaloidal active principles viz., Loganiaceae

(*Strychnos* species) and Menispermaceae (*Abuta chondrodendron* and *Curarea* species). One of the earliest encounters with the poison appears to have been during the exploration of the Lake Maracaibo region ion Colombia by Alonso Perez de Tolosa in 1548. Scientific studies began in the latter part of the century but Humboldt and Bonpland were the first scientists to witness the preparation of poisons at the very beginning of the 19th century. Afterwards upto the middle of the century, its botanical and ethnological studies were made by several workers. Study of its physiology started with the classical experiments of Rudolf von Koelliker and Claude bernard.

9301-0580 Broderick, J.J. (189 Woodland Avenue, River Edge, NJ 07661-2322, USA) **Reflections of a retired flavorist before he forgets: Vanilla-a requiem?**. *Perfumer & Flavorist*, v. 17(5): p. 123-125, 1992 (2 ref, Eng).

Experience of a flavorist in the development of Vanilla flavor have been briefly reviewed.

9301-0581 Buckton, D. (35 Robert Street Willoughby New South Wales 2068, Australia) **Eclipta prostrata**. *Australian Journal of Medical Herbalism*, v. 4(3): p. 91-92, 1992 (21 ref, Eng).

A brief account of the plant *E. prostrata*, previously known as *E. alba* is given. Its habitat, botanical description, constituents, pharmacology, actions uses, dosage etc. have been discussed.

9301-0582 Clark, G.S. (Commodity Services International, Inc., 114 North West Street, Easton, MD 21601 USA) **An aroma chemical profile: Allyl isothiocyanate**. *Perfumer & Flavorist*, v. 17(5): p. 107-109, 1992 (9 ref, Eng).

Natural sources (*Brassica* spp, *Cleome spinosa*, *Lepidium menzieli*, *Putranjiva roxburghii*, horseradish, and *Nasturtium* etc), history, current producers, supply; world consumption, pricing, imports and, substitutes and analogues of allyl isothiocyanate have been discussed.

9301-0583 Dalal, K.C. (AICIP on Medicinal and Aromatic Plants, Gujarat Agricultural University, Anand Campus, Anand 388 110, Gujarat, India) **Present status and perspective of medicinal plants**. *Journal of Research and Education in Indian Medicine*, v. 11(3); p. 15-20, 1992 (Eng).

Research on production aspects of medicinal plants suffers for lack of mechanism for systematically and routinely introducing and investigating these plants since their potential and relevant social aspects are little known to agricultural scientists. It is suggested that greater rapport between scientists engaged in R and D of botany and agriculture and those engaged in R and D of health is the key

to accelerate efforts to provide genuine quality raw material for therapeutic purposes and for its further processing.

9301-0584 Foster, S.. **The Badianus Manuscript: The First Herbal from the Americas.** *Herbal Gram*, No. 27, p. 12-17, 1992 (Eng).

In 1552, the first herbal from the Americas was produced at the Santa Cruz College of Tlaltelolco, Mexico. The Manuscript was written in the native Aztec language, (Nahuatl) by Martin de la Cruz, an Aztec physician. It was translated into Latin by Juan Badiano, an Indian from Xochimilco. The plant information and illustrations and photo in the present article is based on the 1940 edition of the Badianus Manuscript published by Johns Hopkins Press. The Aztec name of each plant is followed by the English translation. Botanical names and medicinal uses are indicated.

9301-0585 Hirsch, A.R.(Smell and Taste Treatment and Research Foundation, Chicago, USA) **The good old smells.** *International Journal of Aromatherapy*, v. 4(3): p. 7-9, 1992 (Eng).

A number of odours have been identified which remind of childhood memories. These have been associated with a positive emotional state. This suggests that odour is an important tool in marketing perfumery products.

9301-0586 Holmes, P.(Artemis Institute of Natural Therapies Cp;pradp, USA) **Lavender oil- a study in contradictions.** *International Journal of Aromatherapy*, v. 4(2): p. 20-22, 1992 (Eng).

Lavender has been used as an apothecary, in bath waters and as a scent since time immemorial. The important species yielding the essential oil are *Lavandula officinalis*, *L.angustifolia*, *L.latifolia*, and *L.fragrans*. Its many uses include as an antiseptic, antiinflammatory, CNS acting, sedative, antipyretic, analgesic, a habit-breaker etc. A brief account of its history, agronomy uses etc has been given.

9301-0587 King, S.R.(Shaman Pharmaceuticals, Inc., USA) **Conservation and tropical medicinal plant research.** *Herbal Gram*, No. 27, p. 28-35, 1992 (16 ref, Eng).

People in the tropical forests of the world have utilized plants as part of their primary health care system for millennia. Today 80 percent of the world's population is dependent on plants for medicines. The tropical forest ecosystems are being erased at an unprecedented rate. Hence all programmes concerning exploitation of plant wealth should be aimed at the conservation, development and protection of the tropical forest region, as well as maintaining biological diversity.

9301-0588 Krbavcic, A.. **Pharmacohistorical note on the siege of Sarajevo 1992.** *Farmaceutski Vestnik*, v. 43(2): p. 131-133, 1992 (4 ref, Slo).

Tamarindus indica, *Commiphora myrrha* and *C.opobalsamum* have been described.

9301-0589 Kula, J., Gora, J.(Institute of General Food Chemistry, Technical University, ul Stefanowskiego 4/10, 90-924 Lodz, Poland) **Tetrahydrofuran and tetrahydropyran derivatives as odor substances.** *Perfumer & Flavorist*, v. 17(5): p. 77-92, 1992 (62 ref, Eng).

The tetrahydrofuran (THF) and tetrahydropyran (THP) nucleus is a very common structural feature of many naturally occurring compounds. Occurrence and odor characteristics of some THF and THP monoterpene derivatives have been tabulated. New methods for the synthesis of THF/THP derivatives, have been discussed. THF and THP odorant synthesis have been reviewed.

9301-0590 Lawrence, B.M.(R.J.Reynolds tobacco Company, Winston-Salem, North Carolina, USA) **Essential oils as sources of natural aroma chemicals.** *Perfumer & Flavorist*, v. 17(5): p. 15-28, 1992 (123 ref, Eng).

Sources of bornyl acetate, alpha-terpienol, terpinen-4-ol, piperitone, chrysanthenone, fenchone, perillaldehyde, benzaldehyde, safrole, alpha, beta and gamma eudesmol amongst the essential oils have been tabulated and discussed.

9301-0591 Lette, C.(2/15 Collins Street Annandale New South Wales 2038, Australia) **Tanacetum parthenium.** *Australian Journal of Medical Herbalism*, v. 4(3): p. 79-85, 1992 (43 ref, Eng).

An account of botany, agronomics, phytochemistry, pharmacology, uses toxicity, medicinal preparations, etc. of *T.parthenium* is given.

9301-0592 Liberti, L.(Facts and comparisons Division, J.B. Lippincott Company, 111 West Port Plaze, Suite 423, St. Louis, Missouri 63146-3098, USA) **Blue cohosh- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Oct. 1992 (10 ref, Eng).

Caulophyllum thalictroides (blue cohosh) continues to be used in black ethnic herbal medicine. Its parturifacient effects are unpredictable and its use can result in severe toxicity. Its pharmacologic activity, however, suggests that blue cohosh may exert pharmacologic activity that should be investigated further. Botany, chemistry, pharmacology and toxicology of the plant have been briefly reviewed.

9301-0593 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St.

Louis, Missouri 63146-3098, USA) **Acacia gum- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Oct. 1992 (7 ref, Eng).

Gum from *Acacia senegal* and some other species of *Acacia* has been used in commerce for millennia. Its soothing properties recommended it for inclusion in cough and cold remedies and it is used topically in wound healing preparations. It is used as a stabilizer for foods. Although generally considered safe for internal use, some persons have developed often severe allergic reactions following exposure to the gum. Botany, history, chemistry, pharmacology and toxicology of the gum have been briefly reviewed.

9301-0594 Liberti, L.(Facts and Comparison Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis, Missouri 63146-3098, USA) **Wintergreen- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Aug. 1992 (8 ref, Eng).

Gaultheria procumbens (wintergreen) and its oil are used commonly in topical analgesic and rubefacient preparations for the treatment of muscular and rheumatic pains. The oil is widely used as a flavor. As with other volatile oils, ingestion of large amounts may be toxic, and smaller amounts may pose a danger to young children. Botany, history, chemistry, pharmacology and toxicology of wintergreen have been briefly reviewed.

9301-0595 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port plaza, Suite 423, St. Louis, Missouri 63146-3098, USA) **Sage- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Aug. 1992 (5 ref, Eng).

Salvia officinalis (Dalmatian sage) and *S.lavandulaefolia* (Spanish sage) are widely used popular spices. Sage oil is used in a variety of culinary applications. Although the plant has a long history of use in traditional medicine, there is little evidence that it provides any unique effects beyond those typically associated with other volatile oils (i.e antispasmodic, carminative). Although the oil contains thujone, there is no evidence of direct toxicity. Botany, chemistry, pharmacology and toxicology of sage have been briefly reviewed.

9301-0596 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St.Louis, Missouri 63146-3098, USA) **Trillium-a monograph.** *Lawrence Review of Natural Products*, pp. 1, July 1992 (6 ref, Eng).

T.erectum and *T.grandiflorum* have a long history of use traditional medicine for the management of bleeding particularly following childbrith. There are no studies to

support this use. Tannin content of *Trillium* may play a role in the topical control of bleeding and the relief from insect bites that the plant is said to affect. Botany, history, chemistry, pharmacology and toxicology of trillium have been briefly reviewed.

9301-0597 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St.Louis, Missouri 63146-3098, USA) **Life root- a monograph.** *Lawrence Review of Natural Products*, pp. 1, July 1992 (7 ref, Eng).

Senecio aureus (life root) has been used in traditional medicine for the management of disorders of the female reproductive tract. There is little pharmacologic evidence to support these uses. Since members of genus *Senecio* contain hepatotoxic alkaloids, the ingestion of this plant can not be recommended for any purpose.

9301-0598 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St.Louis, Missouri 63146-3098, USA) **Blood root- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, July 1992 (20 ref, Eng).

Bloodroot (*Sanguinaria canadensis*), is an old time herbal remedy that continues to find use in modern society. While its oral toxicity is low, its ingeotion is not recommended. However, its topical use as a mouthwash and toothpaste to fight plaque has been documented and products containing bloodroot extracts find use in modern dentistry. Botany, history, chemistry, pharmacology and toxicology fo bloodroot have been briefly reviewed.

9301-0599 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St.Louis, Missouri 63146-3098, USA) **Elderberry- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, July 1992 (7 ref, Eng).

Elderberries are edible berrier (particularly when cooked) from teh elder brush (*Sambucus canadensis*). They have been used medincinally although they are not typically associated with strong medicinal characteristics. One report of toxicity following the investigation of elderberry juice has been recorded, but this appears to have been an isolated incident. History, chemistry, pharmacology and toxicology of *S.canadensis* and *S.nigra* have been briefly reviewed.

9301-0600 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis, Mossouri 63146-3098, USA) **Calendula- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Aug. 1992 (15 ref, Eng).

Calendula officinalis is one of the many plants whose use persists despite no clear evidence that its components exert any consistent pharmacologic effects. Some support in the form of animal studies exists for its topical wound healing and anti-inflammatory uses. The plant appears to have low potential for toxicity, but nevertheless, cannot be recommended at this time for the systemic treatment of any disease. Botany, history, chemistry, pharmacology and toxicology of calendula have been briefly reviewed.

9301-0601 Liberti, L.(Facts and Comparison Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis, Missouri 63146-3098, USA) **Borage- a monograph.** *Lawrence Review of Natural Products*, pp. 1, Aug. 1992 (6 ref, Eng).

Borago officinalis has a long history of use in herbal medicine. It has not been associated with significant toxicity, nor it is known for its pharmacologic activity. Borage teas appear to have little more than a "soothing" effect, common to many herbal teas. Botany, history, chemistry, pharmacology and toxicology of borage have been reviewed.

9301-0602 Liberti, L.(Facts and Comparison Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis, Missouri 63146-3098, USA) **Podophyllum- a review.** *Lawrence Review of Natural Products*, pp. 1-3, Jan, 1992 (27 ref, Eng).

Podophyllum hexandrum and *P.peltatum* and their extracts have been used internally as drastic cathartics and externally in the treatment of venereal warts. Semisynthetic derivatives of the plants are used in the management of a variety of neoplastic disorders. The resin is a mitotic poison and its misuse can lead to significant toxicity. It should not be administered to children and its use in pregnant women has been associated with congenital abnormalities and fetal death. Botany, history, chemistry, pharmacology and toxicology of the plants have been briefly reviewed.

9301-0603 Liberti, L.(Facts and Comparison Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis, Missouri 63146-3098, USA) **Pennyroyal- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Jan. 1992 (13 ref, Eng).

Pennyroyal *Hedeoma pulegioides* and *Mentha pulegium* oil and teas from the plant continue to find use in a variety of herbal self treatment practices. Despite this use, these products are potentially toxic and should not be ingested. The plants are toxic to CNS and liver. Botany, history, chemistry, pharmacology and toxicology of the plants are briefly reviewed.

9301-0604 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis, Missouri 63146-3098, USA) **Yellow dock- a monograph.** *Lawrence Review of Natural Products*, pp.1, Sept. 1992 (4 ref, Eng).

The roots of *Rumex crispus* (yellow dock) and related *Rumex* species exert a laxative effect. The oxalate content of leaf is significant enough to warrant boiling young leaves eaten a salads; older and uncooked leaves should not be eaten. Botany, history, chemistry, pharmacology and toxicology of yellow dock have been briefly reviewed.

9301-0605 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis Missouri 63146-3098, USA) **Black cohosh- a review.** *Lawrence Review of Natural Products*, pp. 1-2, Sept. 1992 (11 ref, Eng).

Cimicifuga racemosa (black cohosh) exhibited a selective reduction in luteinizing hormone in ovariectomized rats and women. It also exhibited hypotensive activity in rabbits and cats. Botany, history, chemistry, pharmacology and toxicology of black cohosh have been briefly reviewed.

9301-0606 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis Missouri 63146-3098, USA) **Bittersweet nightshade- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Sept. 1992 (10 ref, Eng).

Bittersweet nightshade (*Solanum dulcamara*) is a toxic plant that grows wild throughout most of the United States. Use of the plant in traditional medicine is generally limited to external application. Ingestion of the unripened berries, particularly by children, constitutes a medical emergency; other parts of the plant are also toxic. The toxicity is caused by solanine and related glycoalkaloids. Botany, history, chemistry, pharmacology and toxicology of the plant have been briefly reviewed.

9301-0607 Liberti, L.(Facts and Comparisons Division, J.B.Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis Missouri 63146-3098, USA) **Tansy- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Sept. 1992 (10 ref, Eng).

Tanacetum vulgare (tansy) is a common plant having no role in herbal medicine. Although used as an antispasmodic and vermifuge, potential toxicity of the plant outweighs its benefits. Some strains of the plant contain the toxic component thujone. Allergic dermatitis is common with this plant. The plant has been used as tea and food flavour but this use should be discouraged. Botany, history,

chemistry, pharmacology and toxicology of the plant have been briefly reviewed.

9301-0608 Libeti, L.(facts and Comparison Division, J.N. Lippincott Company, 111 West Port Plaza, Suite 423, St. Louis, Missouri 63146-3098, USA) **Cocoa- a monograph.** *Lawrence Review of Natural Products*, pp. 1-2, Jan. 1992 (8 ref, Eng).

Products derived from *Theobroma cacao* are used in a variety of food and cosmetic applications including flavorings and pharmaceutical bases. Although toxicity has been reported, probably from the theobromine and caffeine components, it is generally non-toxic. Botany, history, chemistry, pharmacology and uses, and toxicology of *T.cacao* subsp. *Cacao* have been briefly reviewed.

9301-0609 Madelin, L.. **Threat to the forests.** *International Journal of Aromatherapy*, v. 4(2): p. 6-7, 1992 (Eng).

The alarming issue of world deforestation has highlighted sandalwood *Santalum album* and rosewood (*Aniba rosaeodora*), both sources of essential oils as being among those trees which may be at risk of extinction from over-harvesting. Remedial measures suggest to harvest only those trees which have been damaged or reached the full age (40 years), and the forests are replanted with cultivated specimens. Besides this, programmes for extracting essential oil from rose wood leaves should be encouraged.

9301-0610 Mosciano, G., Fasano, M., Cassidy, J., Connelly, K., Mazeiko, P., Montenegro, A., Michalski, J., Sadural, S.(Bush Boake Allen, 7 Mercedes Drive, Montvale, NJ 07645, USA) **Organoleptic characteristics of flavor materials.** *Perfumer & Flavorist*, v. 17(5): p. 127-129, 1992 (Eng).

Source of procurement, FEMA No, CAS No, synonyms, occurrence in nature, odor characteristics, taste characteristics and suggested applications of 20 flavour materials including coffee oil pure, dill weed oil, octanal natural 50 percent ex. orange, perualdehyde, rum natural and tiglic acid have been described.

9301-0611 Murthy, C.S., Prasad, Y.E., Satyanarayana, G.(Regional Agricultural Research Station, Lam, Guntur 522 034, AP, India) **Supply response of turmeric in Guntur district of Andhra Pradesh.** *Agricultural Marketing*, v. 35(1): p. 16-18, 1992 (3 ref, Eng).

Area under cultivation of *Curcuma longa* in Andhra Pradesh, productivity and prices of turmeric from 1972-73 to 1984-85 have been used to estimate the degree of supply response of turmeric to price and non-price factors. The analysis revealed that neither acreage nor yield was respon-

sive to prices. Steps to increase the production of turmeric have been discussed.

9301-0612 Ohloff, G.(Firmenich SA, CH-1211 Geneve 8, Switzerland) **75 years of perfumery and aroma chemistry published in Helvetica chimica Acta.** *Helvetica Chimica Acta*, v. 75(5): p. 1341-1415, 1992 (244, Eng, Ger).

Work published on perfumery and essential oils in Helvetica Chimica Acta since 1918 has been reviewed.

9301-0613 Pandit, R.K., Suresh Kumar, Sharma, L., Prasad, G.C. (Department of Shalya Shalakya, Institute of Medical Sciences, Banaras Hindu University, Varanasi 221 005, UP, India) **Kanchnar guggulu: A critical review.** *Journal of Research and Education in Indian Medicine*, v. 11(3): p. 39-42, 1992 (8 ref, Eng).

Kanchnar guggulu is an ethical preparation advocated for the management of various glandular swellings like, galgand, gandmala, granthi and arbuda etc. The main Ayurvedic text of Bhaishjyakalpna i.e. Bhava Prakash, Yoga Ratnakar, Vangsen Samhita, Sharangdhar Samhita and Bhaishajya Ratnavali has given almost similar description regarding its contents and indication. Most of the ingredients are Tridosahara especially Kaphvatanashaka. An account of its constituents herbs, contents, properties of herbs and uses is given.

9301-0614 Regeena, S., Kandaswamy, A.(Department of Agricultural Economics, T N Agricultural University, Coimbatore 3, TN, India) **Economics of ginger cultivation in Kerala.** *South Indian Horticulture*, v. 40(1): p. 53-56, 1992 (Eng).

Growth rate in area, production and productivity of the crop as well as its cost of cultivation have been discussed.

9301-0615 Steele, J.J.. **Environmental frogfrancing.** *International Journal of Aromatherapy*, v. 4(2): p. 8-11, 1992 (15 ref, Eng).

Environmental fragfrancing is the ambient transformation by scent of personal, work and public spaces. Importance of natural fragfrances at home in place of work, to an architectural space (sensory engineering) and its psychological impact (aromachology) have been discussed. In order to accomplish a meaningful ambient environmental research, the concept of environmental fragfrances and sensory engineering must be demystified.

9301-0616 Trzan-Herman, N.(Lek d.d., Research and Development, 61000 Ljubljana, Slovenia) **Martindale and other data bases on >CCIS< Compact dick.** *Far-macevtski Vestnik*, v. 43(2): p. 143-146, 1992 (Slo, Eng).

Computerized Clinical Information System (CCIS) has been studied. It provides entire information about drugs and other chemical substances, about their use and emergency care.

9301-0617 Verghese, J.(Synthite Industrial Chemicals Limited, Synthite Valley, Kalenchery 682 311, Kerala, India) **Garlic - The Alladin's wonderful lamp in spices.** *Indian Spices*, v. 29(2): p. 4-7, 16, 1992 (48 ref, Eng).

Botanical characters and propagation methods of *Allicium sativum* alongwith information on delhydrated garlic, allinase and cystein sulfoxides, garlic oil, garlic oleoresin, encapsulated garlic flavours have been given.

9301-0618 Xu Yihe(China Feature, PO Box 522, Beijing, Republic of China) **Guangxi-China's major gum rosin and gum turpentine producer.** *Perfumer & Flavorist*, v. 17(5): p. 117-118, 1992 (Eng).

Growth and prospectus rosin industry in China have been briefly reviewed.

New Publications

9301-0619 (American Botanical Council, PO Box 201660, Austin, Texas, USA) **The Farnsworth Symposium-Progress on Terrestrial and Marine Natural Products of Medicinal and Biological Interest** (Eng 181 pp., \$29.00). *Herbal Gram*, No. 27, p. 53, 1992 (Eng).

In March 1990, medicinal plant symposium titled, "Progress on Terrestrial and Marine Natural Products of Medicinal and Biological Interest" was held in honour of 60th birthday of Prof. N.R. Farnsworth. The published proceedings include 19 scientific papers, 16 abstracts, and 11 abstracts of poster presentation subjects included are: Bioactive Plants of North West Amazon, Traditional Medicine and Medicinal Plants of Burma, Understanding Methods in Chinese Herbal Preparations, Medical Ethnobotany of South America. The Organization and Function of NAPRALERT, Phytochemicals with Potential use in Dental Products.

9301-0620 (American Botanical Council, PO Box 201660, Austin, Texas, USA) **Herbal Gram- The Cumulative Index** (Eng, \$5.00). *Herbal Gram*, No. 27, p. 43, 1992 (Eng).

The contents of Herbal Gram Issues 1-24 (1983-1991) are published in a cumulative index. The entries are alphabetically indexed by subject, volume and page; by Latin binomial, Common names and topic, by author and reference. Books reviewed are listed separately. Market history of traded herbs is also listed.

9301-0621 Ackerman, D.(Chapmans Publications, U.K.) **A Natural History of the Senses** (Eng, 331pp, 6.99-Chapmans; \$11.00- Vintage Books). *International Journal of Aromatherapy*, v. 4(2): p. 38 , 1992 (Eng).

The book covers the origin and evolution of the senses, how they are dealt with in folklore and science and variations from culture to culture. The book is divided into sections of smell, touch hearing and vision. A fascinating section gives an account of the craft of a perfumer creating aromas that influence people. The book is well illustrated.

9301-0622 Akerele, O., Heywood, V., Synge, H. (Eds)(Cambridge University Press, 40 West 20th Street, New York, NY 10011, USA) **Conservation of Medicinal Plants** (Eng, 1991, 362 pp, \$59.95, ISBN 0-521-39206-3). *Herbal Gram*, No. 27, p. 46, 1992 (Eng).

The publication is the Proceedings of an International Consultation held at Chiang Mai, Thailand, March 21-27, 1988. Twenty-seven papers on a wide range of medicinal plant conservation issues comprise part of the publication. The book provides varied background information for beginning to understand the many problems associated with medicinal plant conservation and incorporation of sound scientific principles into the development of medicinal plant conservation as it relates to public health issues.

9301-0623 Atta-ur-Rahman, Ahmad, V.Q.(University of Karachi, Karachi) **¹³C-NMR of Natural Products. Vol. I. Monoterpenes and sesquiterpenes**, Plenum Press: New York 1992 xx+968 pp. 135.00 dollar, ISBN 0-306-4387-6. *Journal of American Chemical Society*, v. 114(19): p. 7611, 1992 (Eng).

This is an excellent compilation of carbon-13 spectral data for a large number of mono- and sesquiterpenes. One presumes that there will be additional volumes following about other terpenes and perhaps other natural products groups. This data are supplied on structural representations of the compounds with the number associated with the appropriate carbons. Four separate indices are provided; name, source (i.e., plant), molecular formula and molecular weight. This volume will certainly serve as a ready source of carbon-13 spectral data for a large range of compounds. It should be useful to not only natural products chemists but also those looking for structural models to use analogously when assigning carbon-13 shifts.

9301-0624 Barriere, S.L. (Ed)(Pharmaceutical Products Press, Imprint of the Haworth Press, Inc., 10 Alice Street, Binghamton, New York, USA) **Journal of Pharmaceutical Care in Infectious Disease Management.** (Eng).

The Haworth Press Inc., announces the forth coming publication of a new quarterly Journal of Pharmaceutical

Care in Infectious Disease Management, scheduled for publication in spring 1994. The journal would focus information on the applications of pharmaceutical care to disease management. The content area is proposed as: research in pharmaceutical care, pharmacotherapy, case studies, state-of-the-art reviews, current events, book reviews etc.

9301-0625 Bastien, J.W.(University Press of Utah, 101 USB, Salt Lake City, Utah 84112) **Healers of the Andes: Kallawaya Herbalists and Their Medicinal Plants** (Eng, 1987, 198 pp, \$37.50, ISBN 0-87480-278-4). *Herbal Gram*, No. 27, p. 47, 1992 (Eng).

Anthropologist Joseph Bastien spent several years among Kallawaya traditional healers compiling data on their 1000 year old herbal medicine. First half of the book includes author's relationship with the people, their herbal history, Andean and Greek humoral theories, etc. The second half of the book, a "compendium of Kallawaya Medicinal Plants and Their Uses" includes 60 plants. The book is well illustrated.

9301-0626 Benedetti, M.D.H.(Waterfront Press, 52 Maple Ave, Maple Wood, NJ 07040, USA) **Earth and spirit: Healing lore and More from Puerto Rico** (Eng, 1989, 245pp, ISBN 0-943862-46-9). *Herbal Gram*, No. 27: p. 51, 1992 (Eng).

The publication is a collection of stories anecdotes and recipes from grannies and medicine men of Puerto Rico. Interesting ethnobotanical insight to the folk medicine of Puerto Rico is given.

9301-0627 Boyle, W.(Buckeye Press, East Palestine OH44413, USA) **Official Herbs: Botanical Substances in the United States Pharmacopoeias 1820-1990** (Eng, 1991, \$12.95). *Herbal Gram*, No. 27, p. 47, 1992 (Eng).

Many of the herbs in the USP were native American plants, often introduced into pharmacy and medicine by the natives. This book examines all editions of USP from 1820 to the present and is an important contribution to the literature.

9301-0628 Fischer-Rizzi, S.(Sterling Publishers, U.K.) **Complete Aromatherapy Handbook: Essential oils for Radiant Health** (Eng, 240pp, 11.50, \$14.95). *International Journal of Aromatherapy*, v. 4(2): p. 38-39, 1992 (Eng).

The publication resembles a directory of essential oils. Eight introductory sections covering topics such as methods of extraction, application and purity etc form the basic material. This is followed by a directory of 27 oils. For each oil an entry outlines its historical use, details relating to the production of the oil and comments on modern day applications. The third part of the book covers another 47

essential oils. The final part is devoted to choosing and blending essential oils. The book is well illustrated.

9301-0629 Foster, S. (Ed)(American Herbal Products Association) **Herbs of Commerce** (Eng, \$39.50). *Herbal Gram*, No. 27, p.3, 1992 (Eng).

This publication includes a checklist of over 550 species of primary plant names of herbs in commerce in the United States with over 1,800 cross-referenced names. A bewildering number of common names, as well as out-dated Latin names, are currently used in the commercial herb market. Herbs of Commerce is not only a useful key for accurate identification of herbs presently on the market, but a viable industry standard which will help reduce such confusion in the future. Herbs of Commerce is a must for wholesalers, retailers and consumers.

9301-0630 Gerdes, D. (Ed)(Food Products Press, The Haworth Press, Inc., 10 Alice Street, Binghamton, New York, USA) **Journal of Culinary Practice**. (Eng).

New York-Food Products Press, announces the publication of a new professional quarterly journal, the Journal of Culinary Practice and will be the first journal devoted to research-based articles for food services etc. Areas covered for articles publication will be new findings on food cooking, applications of sensory analysis, chemistry of food cooking as well as many allied topics.

9301-0631 Glasby, J.S.(Taylor and Francis Ltd. 4, John St. London) **Dictionary of Plants Containing Secondary Metabolites** (Eng, 1991, 488pp, \$209). *Journal of Ethnopharmacology*, v. 35(2): p. 201-202, 1991 (Eng).

The book contains useful information on about 1750 species mostly phanerogams covered in 348 pages. The plant species alphabetically arranged gives information on the chemical constituents and a list of literature sources.

9301-0632 Johns, T.(University of Arizona Press, Tucson, AZ 85719, USA) **With Bitter Herbs They Shall Eat It: Chemical Ecology and the Origins of Human Diet and Medicine**. *Economic Botany*, v. 46(2): p. 180, 1992 (Eng).

The book highlights the steroidal glyco-alkaloid constituents of wild potato *Solanum* spp. domesticated by the Aymara speaking people of the Bolivian Andes. However the book is a blend of ethnobotany and chemical ecology. The first of eight chapters, describes how man deals with plant chemicals in the environment; chapter 2 examines human adaptations to plant toxins, chapters 3 and 4 decontamination methods are described, chapter 5 perception of the taste of glycoalkaloids and sensory evaluation of these compounds are described, chapter 6 to 8 describe the use of non food plants by primates and the history of human

medicine. The book also contains 2 appendices, a bibliographical list and a comprehensive index.

9301-0633 Khoury, R. (Ed)(National Herbalists Association of Australia. PO Box 65, Kingsgrove NSW 2208, Australia) **Australian Journal of Medical Herbalism** (Eng, ISSN 1033-8330). (Eng).

The *Australian Journal of Medical Herbalism* publishes material on all aspects of medical herbalism with emphasis on the philosophy of medical herbalism and the phytochemistry, pharmacology and clinical applications of medicinal plants. The September 1992 issue under review volume 4, number 3, pages 69-100, gives information on medicinal plants, viz., *Tanacetum parthenium*, *Eclipta alba* and management of menopause as well as reviews from medicinal plant research journals.

9301-0634 La Barre, W.(University of Oklahoma Press, Norman, OL 73019, USA) **The Peyote Cult** (5th ed, Eng, 1989, 334 pp. \$14.95, ISBN 0-8061-2214-5). *Herbal Gram*, No. 27, p. 51, 1992 (Eng).

The book is an updated version of the classic reference on this subject first published in 1938 and gives a detailed account of the hallucinogenic cactus (*Lophophora williamsii*), central to the religious life of the native Americans. The enlarged edition contains 234 new entries on anthropology, chemistry, botany and pharmacology of peyote and its alkaloids.

9301-0635 Lawless, J.(element Books Ltd, UK) **Encyclopaedia of Essential Oils** (Eng, 232 pp., Pounds 99, \$14.95). *International Journal of Aromatherapy*, v. 4(1): p. 34, 1992 (Eng).

This Encyclopaedia is a standard source of reference in the field of aromatics and provides information on a wide range of essential oils. It is in two parts: Part I provides an excellent introduction to the subject of aromatics and includes material on plant origin, ancient civilizations, aromatherapy, medical herbalism, properties and action of herbs and essential oils and creative blending. Part II surveys 165 essential oils and includes actions and characteristics of each oil, principle constituents, and folk traditions; safety data, therapeutic properties and current commercial uses. Also provided are a glossary of technical terms therapeutic index.

9301-0636 Morales, E.(University of Arizona Press, 1230 N Park Ave Suite 102, Tucson, AZ 85719-4140) **Cocaine: White Gold Rush in Peru** (Eng. 1989, 228 pp., ISBN 0-8165-1159-4), USA. *Herbal Gram*, No. 27, p. 51, 1992 (Eng).

The book is a sociologists' insight into the history and tradition of cocoa leaf use and its production in Peru. Information on the current legal economic sociopolitical problems associated with the illicit cocaine production for North American and European markets, is given.

9301-0637 Mulligan, G.A., Munro, D.B.(Canadian Government Publishing Center, Supply and Services Canada, Ottawa, Canada K1A0S9) **Poisonous plants of Canada** (Eng. 1990. 96 pp. \$8.95, ISBN 0-660-13467-5). *Herbal Gram*, No. 27, p. 50, 1992 (Eng).

The book lists the poisonous plants arranged alphabetically by plant family.

9301-0638 Murray RDH, Robinson, J.A.(Springer-Verlag, Vienna and New York) **Progress in the Chemistry of Natural Products** (Eng, 1991, vi+343pp. DM 280). *Journal of American Chemical Society*, v. 114(17): p. 6948, 1992 (Eng).

This book consists of two outstanding chapters. In the first, discusses the chemical and biochemical aspects of polyether antibiotics. The second chapter, covers naturally occurring plant coumarins discovered between 1978 and 1989 and lists larger number of coumarins. Extensive tables list the new coumarins on the basis of their substitution pattern. For each coumarin, the trivial name is cited, together with the year of isolation, the structure, formula, physical constants, and plant source(s). All relevant references are also furnished. Throughout the book, structures are drawn clearly and uniformly, and the printing is impeccable. PID, New Delhi.

9301-0639 Sanderson, H., Harrison, J.(Hands on Publishers, UK) **Aromatherapy and Massage for People with Learning Difficulties** (Eng, pp 181, 8.95). *International Journal of Aromatherapy*, v. 4(2): p. 39, 1992 (Eng).

The book emphasizes the role of aromatherapy and massage to people with learning difficulties and discusses the role of interactive massage and multisensory massage. A list of oils and their uses is presented.

9301-0640 Sudhir Chandra(Deep Publications. A-3/27A, DDA Flats, Paschim Vihar, New Delhi, India) **Foundations of Ethnobotany (Pre-1900 Ethnobotany- A Review and Bibliography)** (1991, Eng, ii+187 pp., Rs. 150.00, ISBN No. 81-85622-01-9). *Economic Botany*, v. 46(3): p. 344, 1992 (Eng).

The term 'Ethnobotany' was coined by J.W. Harshberger in 1895. This book provides information regarding ethnobotanists and botanical historians since the birth of civilization in diverse regions, languages and archaeological remains. Informative notes on the origin of

terms and concepts relating to ethnobotany and related topics, have been provided. The main text has 787 biographic and bibliographic entries. The names of scientist is followed by his/her native country, area of work, eponym and publications. A general index is provided which leads to references on the various topics such as entries under Bible plants, Emblematic Botany, Ethnobotany, languages, etc.

9301-0641 Turner, N.J., Szczawinski, A.F. (Timber Press, 9999 S.W. Wilshire, Portland, OR 97225, USA) **Common poisoners plants and mush rooms of North America** (Eng, 1991, pp 311, 220 Illustrations, \$55.00, ISBN0-88192-179-3). *Journal of Ethnopharmacology*, v. 35(2): p. 201, 1991 (Eng).

Beautifully illustrated the introductory pages of the book present a report on poisoning and how to prevent it. The five chapters that follow cover (1) an introduction to poisonous plants; (2) poisonous mushrooms, (3) poisonous plants of wild areas, (4) poisonous garden and crop plants; and (5) poisonous house plants and plant products.

0642 Weniger, B., Robineau, L., Soejarto, D.D., Gyllenhal, C. (Enda-Caribe, Aptdo 21000 Huacal, Santo Domingo, Republic Dominica) **Elements for a Caribbean Pharmacopoeia** (1988, 318 pp., \$20.00). *Herbal Gram*, No. 27, p. 46, 1992 (

The book is the product of a workshop held in Havana, Cuba, November, 1988. Based on ethnobotanical surveys, the compilation includes 90 monographs with details on nomenclature, distribution brief descriptions and the uses of plants, and information on chemistry and biological activity. The publication provides practical information on medicinal plants of the Carribbean, valuable for the treatment of common ailments.

9301-0643 Wilbert, J. (Yale University Press, 92A Yale Station, New Haven, CT06520, USA) **Tobacco and Shamanism in South America** (Eng, 1987, 294 pp., ISBN 0-300-03879-9). *Herbal Gram*, No. 27, p. 51, 1992 (Eng).

This book is part of a larger series in the "psychoactive plants of the world". The book is a detailed account of the methods of tobacco use, pharmacology of various types of tobaccos, and the use in native religions of South America. Also included are a 77 page bibliography citing works in 10 languages and an index.

Patents

9301-0644 Akimi, K., Yoshihiro, U. (Osaka Yakuhin Kenkyusho K K, Japan) **Preparation of medicinal saponins from *Astragalus membranaceus* roots**, Japan

Kokai Tokkyo Koho, JP, 62,12,791 (Cl C07H15/256), 1987, 11PP. (Eng, Jap).

Saponins such as astragaloside are isolated from the methanol extracts of *A. membranaceus*. Roots were refluxed with methanol and subjected to fractionation by column chromatography, using CHCl₃-MeOH-H₂O solvent system. The fractions were collected and further subjected to reverse chromatography to recover acetyl astragaloside, I, astragaloside I, isoastragaloside, I, astragaloside II, astragaloside III, astragaloside IV, astragaloside V, astragaloside VI, astragaloside VII, and soyasaponin I. All the saponins are reported to inhibit the formation of lipid peroxides induced by i.p administration of adriamycin (15mg/kg) in rats. Astragaloside VIII is reported to inhibit lipid per oxide formation in humans and animals.

9301-0645 Chiaki, N., Yoshio, K., Shigehiro, Y., Masaki, S., Yasuko, T., Takeo, N. (Terumo Corporation, Japan) **Polysaccharides as enhancers of antibody formation**, Japan Kokai Tokkyo Koho JP 62,167729 (Cl.A61K31/715) 1987, 6 pp. (Eng, Jap).

Bark of *Melia azadirachta* yielded polysaccharides, which are very useful as antibody enhancers. the polysaccharides (1000mg) are usually administered by dissolving in 500 mL sterilised 5 percent glucose solution. This solution was preserved in 5-mL vials and then freeze dried. Each vial contained 10mg polysaccharide, which can be administered by dissolving in water prior to injection. The enhancement of antibody formation against sheep red blood cells in mice has been demonstrated by i.p. injecting the red blood cells and the polysaccharide simultaneously. The enhancement of anti-body formation was revealed by observing the increased number of plaque-forming cells in the spleen.

9301-0646 Hiroshi, S.. **Anti-HIV (human immunodeficiency virus) agents from pine cones**. (Eng).

Two high mol-wt. anti HIV agents KS-6 and KS-7 were isolated by extracting pine cones from alkalinized water. Pine cones were refluxed with methanol and with 85 percent ethanol and again treated with 3 percent boiling water. The residue obtained was taken in 1.1 percent NaOH solution, and the solution in filtered and filtrate was adjusted to pH5. The precipitate was collected by centrifugation and taken again in 1 percent NaOH. The insoluble material was removed by centrifugation and supernatant was treated with equal quantity of ethanol to recover KS-7. Both KS-6 and KS-7 were dialysed and lyophilized. KS-6 (30 microg/ml) inhibited in vitro HIV replication in a T-cell line from human leukemia patient. IARI, New Delhi.

9301-0647 Ichiro, K., Michio, F. (Sohoei Chemical Industry Company Limited, Japan) **Ginsenosides and lucyosides as**

antioxidants and potential drugs and their extraction from the gourd. (Eng, Jap).

Ginsenosides I (R= glucose, glucosylhamnose) Z= glycosyl in a given structural formula) and lucyosides II (R1= Me, CH₂OH, CHO; R2=H, beta-D-glucopyranoside R3,R4=H, OH) were isolated from the methanol extracts of gourd. They are useful as potential medicinal antioxidants peroxidation for prevention of lipid per oxidation and for food and cosmetics. Methanol extract of gourd leaves by refluxing at 60 degree C for 5 hours, purification by chromatography gave glucosides E and F. Gourd extracts by lucyosides were demonstrated for inhibition of lipid peroxidation by making use of fish tissue extracts.

9301-0648 Lappi, Douglas A., Carlo, M.P. , Marco, S.(Farmitalia Carlo Erba SPA) **Ribosome in-activating protein from Saponaria officinalis immunotoxins containing it and their preparations, and pharmaceuticals containing the immunotoxin, German Offen De 3,724,323 (Cl. C07 K15/10), 1988, 12PP. (Ger, Eng).**

Forzen *Saponaria officinalis* was subjected to homogenisation followed by centrifugation. The supernatant was separated and dialysed followed by chromatography on mono-S. The column was washed and eluted with 80 percent gradient of 0.3M NaCl-50 mM Na-borate buffer, pH9.5. The eluted SO-4-a ribosome inactivating protein, was subjected to conjugation by SS bonds to a rat monoclonal antibody to mouse T-cells. The 50 percent inhibitory concentration of the SO-4 towards the protein synthesis in mouse leukemia cells was 4.9×10^{-11} M compared to 1.5×10^{-7} M for unconjugated SO-4. IARI, New Delhi.

9301-0649 Lasszlo, A., Altila, Z., Autal, S.('Mora Ferenc" Mg TSz, Szeged, Hungary) **Process for the extraction and purification of Capsaicin from red pepper, Hung Telijes Hu 41,000. (Eng, Hun).**

Red pepper *Capsicum annum* chilliensis is utilised for the separation of capsaicin. Pulp and seed from the fruits are separated and extracted with organic solvent (for the pulp) and with alkali (for the seed). When red pepper pulp was refluxed with acetone (1000 L) followed by solvent evaporation, and the residue is dissolved in toluene (50L, 20 percent) containing benzene, followed by partitioning of the residue in alcohol yielded capsaicin (0.1-0.3 percent) upon crystallisation.

9301-0650 Lorenz, W.(Fink GmbH, Germany) **Use of ruscogenins in medications for the treatment of prostate disorders, European Pat. Appl. EP 224,386 (Cl. A61K31/565), 1987, 6PP. (Ger, Eng).**

Medicaments for the treatment of prostate disorders (no details given) are reported to contain plant sapogenins isolated from *Ruscus* extract. They include ruscogenin, or neo-ruscogenin or their stereoisomers or ruscogenin saponins. In vivo hydrolysable derivatives are also used for the medicaments, along with hesperidine or a chalcone. IARI, New Delhi.

9301-0651 Luitpold, L.(Kneipp- Werke Kneipp-Mittel Zentrale Leusser Und Oberhaeusser) **Manufacture of active material extract from medicinal plants by using essential oil as solvent, German Offen De 3,542,354 (Cl. A61 K35/78), 1987, 3PP. (Ger, Eng).**

A solvent in the form of essential oil of the plant is made use of to extract pharmacologically active compounds. The oil remains unaffected as component of the extract. The presence of the essential oil helps in extracting all the active compounds in the plant extracts, alongwith other lipophilic compounds. IARI, New Delhi.

9301-0652 Makota, T., Yutaka, A., Keuji, M.(Ichimaru Company Limited, Japan) **Cosmetics for treatment of alopecia containing testosterone 5-alpha-reductase inhibitors from plants extracts, Jap Kokai Tokkyo Koho, JP, 62,116,520. (Eng, Jap).**

Extracts of *Swertia japonica*, *Rehmannia*, *Aloe aroborescens* licorice root, *Hydrangea macrophylla* and ginseng contain testosterone 5-alpha-reductase inhibitors which are very useful in preventing hair loss. Juglone, lownone, aloin and shikonin all are shown to be testosterone 5alpha reductase inhibitors and these compounds are used in cosmetics.

9301-0653 Yasushi, O., Akiko, K., Noboru, S. , Tsunematsu, T. (Mitsubishi Chemical Industries Company Limited, Japan) **Isolation of piperidine-type alkaloid from Piper longum, Japan Kokai Tokkyo JP 62,178,572 (Cl. C07 D317/67), 1987, 3PP. (Jap, Eng).**

Piperidine type alkaloid has been extracted from the fruit powder by making use of methanol solvent. Maximum yields of the alkaloids as obtained by extracting with methanol three times at room temperature, followed by extracting the residue with distilled water and ester solvent. Solvent system was thoroughly mixed and the ester layer separated and distilled to recover pure product of piperidine type alkaloid. The compound exhibited coronary vasodilatory activity on in vitro test using rabbit heart at the dose level of 1-100 micro gm. IARI, New Delhi.

9301-0654 Yasutake, H.. Glycyrrhizin from licorice as anticaries agent, Japan Kokai Tokkyo Koho JP 63,198,616 (Cl. A61 K7/16), 1988, 4PP. (Jap, Eng).

Licorice yield glycyrrhizin which prevents dental caries. The inhibitory activity of glycyrrhizin on the formation of glucans and dental plaque was demonstrated in a

culture medium containing *Streptococcus mutans* and sucrose. Glycyrrhizin at greater than or equal to 1mM effective in inhibiting the dental plaque. Leaves and stems of *Gymnema sylvestre* yielded gymnemic acid which when added to oral formulations of glycyrrhizin decreases sweet taste. IARI, New Delhi.

List of Serials Abstracted in MAPA

Volume 15(1), 1993

1. *Acta Alimentaria*, 1991, 20(3-4), 21(2)
2. *Acta Biochimica et Biophysica Sinica*, 1992, 24(1,2)
3. *Acta Ciencia Indica*, 1991, 17C(4)
4. *Acta Pharmaceutica Sinica*, 1992, 27(1,2,3)
5. *Advances in Plant Sciences*, 1992, 5(Special issue)
6. *Agricultural and Biological Chemistry*, 1991, 55(6)
7. *Agricultural Marketing*, 1992, 35(1)
8. *Ancient Science of Life*, 1989, 9(1)
9. *Asian Journal of Chemistry*, 1992, 4(4)
10. *Asian Journal of Plant Science*, 1991, 3(1)
11. *Australian Journal of Agricultural Research*, 1989, 40(5)
12. *Australian Journal of Medical Herbalism*, 1989, 4(3)
13. *Australian Veterinary Journal*, 1992, 69(7)
14. *Bionature*, 1992, 12(1&2)
15. *Biosphere*, 1991, 3(1)
16. *Biotechnology Letters*, 1992, 14(8)
17. *Bioved*, 1991, 2(2)
18. *Botanica Complutensis*, 1990, 16
19. *Canadian Journal of Botany*, 1992, 70(2)
20. *Ceskoslovenska Farmacie*, 1992, 41(3,4-5)
21. *Cheiron*, 1991, 20(2&3)
22. *Chemical and Pharmaceutical Bulletin*, 1992, 40(4)
23. *Chinese Journal of Biotechnology*, 1991, 7(3)
24. *Chinese Journal of Integrated Traditional and Western Medicine*, 1991, 11(6)
25. *Chinese Science Bulletin*, 1992, 37(7,9)
26. *Current Medical Practice*, 1992, 36(4)
27. *Deerghayu International*, 1992, 8(4)
28. *Economic Botany*, 1992, 46(2,3)
29. *FAO Plant Protection Bulletin*, 1991, 39(1)
30. *Farmaceutski Vestnik*, 1992, 43(2)
31. *Fertiliser News*, 1992, 37(10)
32. *Fitoterapia*, 1992, 63(4)

33. Flavour and Fragrance Journal, 1992, 7(1,2,3,4,5)
34. Geobios, 1992, 19(4)
35. Helvetica Chimica Acta, 1992, 75(5,6)
36. Herbal Gram, 1992, No.27
37. Indian Drugs, 1992, 29(12,13)
38. Indian Cocoa, Arecanut and Spices Journal, 1991-1992, 15(2,3)
39. Indian Farming, 1992, 41(2)
40. Indian Forester, 1992, 118(8,9)
41. Indian Journal of Chemistry, 1992, 31B(11)
42. Indian Journal of Chest Diseases and Allied Sciences, 1990, 32(4)
43. Indian Journal of Experimental Biology, 1992, 30(5,9,10,11)
44. Indian Journal of Forestry, 1992, 15(1)
45. Indian Journal of Medical Research, 1992, 96B
46. Indian Journal of Pharmaceutical Sciences, 1992, 54(4,5)
47. Indian Journal of Physiology and Allied Sciences, 1992, 46(2)
48. Indian Journal of Plant Genetic Resources, 1988, 1(1/2), 1989, 2(1,2), 1990, 3(1,2)
49. Indian Medicine, 1992, 4(2)
50. Indian Spices, 1992, 29(2)
51. International Journal of Animal Sciences, 1992, 7(2)
52. International Journal of Aromatherapy, 1992, 4(1,2,3)
53. International Journal of Pharmacognosy, 1992, 30(1,2)
54. Journal of Agricultural and Food Chemistry, 1992, 40(3,7,8)
55. Journal of American Chemical Society, 1992, 114(17,19)
56. Journal of Biological Science Society of North East India, 1991, 1(1)
57. Journal of Economic and Taxonomic Botany, 1991, 15(1)
58. Journal of Ecotoxicology and Environmental Monitoring, 1992, 2(1)
59. Journal of Environmental Biology, 1992, 13(3)
60. Journal of Essential Oil Research, 1992, 4(5)
61. Journal of Ethnopharmacology, 1991, 35(1,2,3); 1992, 36(1,2,3)
62. Journal of Faculty of Pharmacy, Gazi, 1991, 8(2); 1992, 9(1)
63. Journal of Indian Chemical Society, 1992, 69(2)
64. Journal of Medicinal Chemistry, 1992, 35(2,15)
65. Journal of Natural Products, 1992, 55(6,9,10)
66. Journal of Nepal Chemical Society, 1991, 10
67. Journal of Organic Chemistry, 1992, 57(19,22)
68. Journal of Plant Anatomy and Morphology, 1991, 5(2)

69. Journal of Research and Education in Indian Medicine, 1992, 11(1,3)
70. Journal of the Essential Oil Research, 1992, 4(5)
71. Journal of the Indian Chemical Society, 1991, 69(2)
72. Journal of the Institution of Chemists (India), 1991, 63(Pt.III)
73. Korean Journal of Pharmacognosy, 1992, 23(1)
74. Lawrence Review of Natural Products, 1992, (Jan, July, Aug, Sep., Oct.)
75. Natural Product Reports, 1992, 9(1,3,5)
76. Oriental Journal of Chemistry, 1992, 8(3)
77. Pakistan Journal of Scientific and Industrial Research, 1992, 35(3,4)
78. Parfümerie und Kosmetik, 1992, 73(8)
79. Parfümer & Flavorist, 1992, 17(5)
80. Phytochemistry, 1992, 31(7,9,10)
81. Phytotherapy Research, 1992, 6(5,6)
82. Plant Cell Reports, 1992, 11(2,3,4,5/6,8,10)
83. Plantes Medicinales et Phytotherapie, 1991, 25(4)
84. Polish Journal of Chemistry, 1992, 66(3,6)
85. Scientia Pharmaceutica, 1992, 60(1-2)
86. Shoyakugaku Zasshi, 1992, 46(2,3)
87. South Indian Horticulture, 1992, 40(1,2)
88. Tropical Agriculture (Trinidad), 1992, 69(4)
89. Yakugaku zasshi, 1992, 112(4,6)

ANNOUNCEMENT

Bharatiya Vaigyanik evam Audyogik Anusandhan Patrika

A new research journal in Hindi devoted to all areas of science and technology

This multidisciplinary journal in Hindi proposed to be published half-yearly by the Publications and Information Directorate is devoted to all branches of science such as chemistry, physics, botany, zoology, biochemistry, biophysics, geology, marine science, etc. along with various areas of engineering and technology. Articles on the newly emerging fields like biotechnology, pollution control, alternative sources of energy, science and society, information science, etc. will also be considered for publication.

Besides original research papers, review articles, conference reports on national and international seminars/symposia and book reviews will also be published. It will carry a section on scientific digests too.

To ensure that the standard of the new Journal is at par with the existing research journals, the papers received for publication to this Journal will be subjected to the reviewing by subject experts. To facilitate reviewing by referees drawn from an international panel, the authors are requested to provide an authenticated version of the paper(s) in English also.

Abstract/Summary of the article along with authors' names, address and key words will be published in English too for a wider dissemination and facilitation to the abstracting and indexing services.

Papers may be sent to :

Editor

Bharatiya Vaigyanik evam Audyogik Anusandhan Patrika

Publications & Information Directorate

Dr K S Krishnan Marg

New Delhi 110 012

Botanical Names Index

ABELMOSCHUS MOSCHATUS 0315
ABIES SPECTABILIS 0472
ABIES VEITCHII 0462
ABUTA SPP 0579
ACACIA SENEGAL 0593
ACACIA SPP 0593
ACANTHACEAE 0248 0383 0535
ACANTHOPANAX CHIISANENSIS 0130
ACANTHOPANAX DIVARICATUS 0130
ACANTHOPANAX KOREANUM 0130
ACANTHOPANAX SENTICOSUS 0130
ACANTHOPANAX SENTICOSUS FORMA INERMIS 0130
ACANTHOPANAX SESSILIFLORUS 0130
ACANTHOPANAX SIEBOLDIANUM 0130
ACER NEGUNDO 0353
ACER SACCHARUM 0294
ACERACEAE 0294 0353
ACHILLEA MILLEFOLIUM 0310 0504
ACHILLEA MILLEFOLIUM SSP MILLEFOLIUM 0328
ACOKANTHERA SPECTABILIS 0213
ACONITUM ATROX 0018
ACONITUM SPP 0206
ACORUS GRAMINEUS 0231
ADIANTUM CAPILLUS-VENERIS 0121
ADONIS AESTIVALIS 0374
AEGLE MARMELOS 0063
AESCULUS INDICA 0258
AGASTACHE FOENICULUM 0084
AGERATUM CONYZOIDES 0265
AGRIMONIA EUPATORIA 0116
AGRIMONIA PROCERA 0116
ALIBERTIA MACROPHYLLA 0256
ALISMACEAE 0405
ALLIACEAE 0085 0205
ALLIUM CEPA 0205 0560
ALLIUM CHINENSE 0205
ALLIUM SATIVUM 0085 0205
0399 0426 0560 0617
ALLOSYNCARPIA TERNATA 0302
ALOE AFRICANA 0452
ALOE ARBORESCENS 0230 0652
ALOE BARBADENSIS 0046
ALOE FEROX 0452
ALOE SPICATA 0452
ALOE VERA 0111
ALPINIA GALANGA 0114
ALSTONIA ANGUSTIFOLIA 0434
ALSTONIA SPP 0289
ALTHAEA OFFICINALIS 0120
ALYSSUM SAXATILLO 0522
AMARANTHACEAE 0252 0261
AMARANTHUS TRICOLOR 0252
AMARYLLIDACEAE 0172
AMBROSIA HISPIDA 0281
AMMI MAJUS 0001
AMMI VISNAGA 0146
AMOMYRTELLA GUILI 0481
AMOMYRTUS LUMA 0481
AMOMYRTUS MELI 0481
AMSONIA TABERNAEMONTANA 0072
ANACARDIACEAE 0535
ANCISTROCLADACEAE 0300
ANCISTROCLADUS TECTORIUS 0300
ANEMARRHENA ASPHODELOIDES 0322
ANETHUM GRAVEOLENS 0001 0567
ANGELICA SPP 0232
ANGELICA ARCHANGELICA 0218
ANIBA ROSAEODORA 0609
ANNONA SQUAMOSA 0257 0491
ANNONACEAE 0257 0343 0349 0404 0405 0428
0464 0491
ANODENDRON AFFINE 0340
ANOGEISSUS SERICEA 0075
ANOGEISSUS SERICEA VAR SERICEA 0075
ANTHEMIS NOBILIS 0380
ANTHEMIS SPP 0176
APHANAMIXIS POLYSTACHYA 0132
APIACEAE 0222 0379 0501 0557
APIUM GRAVEOLENS 0001 0048
APOCNACEAE 0078
APOCYNACEAE 0266 0023 0059 0031 0070 0072
0081 0094 0095 0099 0101 0105 0106 0177
0213 0264 0270 0289 0340 0341 0416 0434
0445
AQUIFOLIACEAE 0363
ARACEAE 0074 0231 0458
ARALIACEAE 0113 0130 0178
0193 0220 0372 0454 0493 0497 0531 0547
ARAUCARIACEAE 0405
ARCTOSTAPHYLOS SP 0144
ARGYREIA SPECIOSA 0368
ARISTOLOCHIA BOTTAE 0216
ARISTOLOCHIA CONTORTA 0381
ARISTOLOCHIA CYMBIFERA 0382
ARISTOLOCHIA MOLLISSIMA 0386
ARISTOLOCHIAEAE 0386 0216 0381 0382 0405
ARISTOTELIA AUSTRALASICA 0427
ARNICA SPP 0557
ARTEMISIA ABSINTHIUM 0502
ARTEMISIA AFRA 0242
ARTEMISIA ANNUA 0045
ARTEMISIA ARBORESCENS 0176
ARTEMISIA CAPILLARIS 0383
ARTEMISIA FEEDEI 0460
ARTEMISIA JUDAICA 0508 0510
ARTEMISIA MONOSPERMA 0278
ARTEMISIA MOORCROFTIANA 0480
ARTEMISIA PACIFICA 0254
ARTEMISIA VULGARIS 0121
ASCLEPIADACEAE 0264 0373
ASCLEPIADACEAE(PATENT) 0654
ASIMINA PARVIFLORA 0428
ASPARAGUS RACEMOSUS 0068
ASPILIA MOSSAMBICENSIS 0209
ASTER SCABER 0410
ASTERACEAE 0065 0121 0209 0254 0278 0281
0310 0325 0328 0383 0400 0410 0432 0502
0504 0507 0508 0529 0535 0557 0581 0591
0597
ASTERISCUS PYGMAEUS 0277
ASTRAGALUS MEMBRANACEUS 0644
ASTRAGALUS MEMBRANACEUS VAR MONGHOLICUS 0226
ATRACTYLOIDES LANCEA 0076
ATRACTYLOIDES OVATA 0003
ATROPA BELLADONNA 0097 0554
AVERRHOA CARAMBOLA 0346
AVERRHOACEAE 0346

- AZADIRACHTA INDICA 0013 0023 0092 0160 0179
0186 0542
- BACCHARIS NEAEI 0325
- BALANITES AEGYPTIACA 0350
- BALLOTA 0513
- BALSAMINACEAE 0490
- BARRINGTONIA ACUTANGULA 0535
- BASELLA RUBRA 0290
- BASELLACEAE 0290
- BAUHINIA VARIEGATA 0147 0613
- BELAMCANDA CHINENSIS 0571
- BERBERIDACEAE 0144 0364 0375 0466 0562 0592
- BERBERIS CONGESTIFLORA 0466
- BERBERIS HORRIDA 0466
- BERBERIS KOREANA 0375
- BIDENS PILOSA 0415
- BIGNONIA TUIRA 0201
- BIGNONIACEAE 0180 0201 0234 0267
- BIOPHYTUM SENSIVITUM 0535
- BLUEPHARIS EDULIS 0383
- BOLBOSTEMMA PANICULATUM 0196
- BORAGINACEAE 0173 0176 0219 0390 0535 0601
- BORAGO OFFICINALIS 0601
- BOUGAINVILLEA SPECTABILIS 0023
- BRASSICA 0582
- BRASSICA OLERACEA VAR CAPITATA 0339
- BRASSICACEAE 0582
- BREYNIA OFFICINALIS 0449
- BRYONIA ALBA 0376
- BUDDLEIA ASIATICA 0333
- BUPLEURUM FRUTICOSUM 0083
- BURSERACEAE 0147 0588 0613
- CACTACEAE 0634
- CAESALPINIACEAE 0253 0405
- CALENDULA OFFICINALIS 0176 0396 0600
- CALIBRACHOA PARVIFLORA 0324
- CALOPHYLLUM INOPHYLLOIDE 0335
- CALOPHYLLUM LANIGERUM 0190
- CALOTROPIS PROCERA 0264
- CAMELLIA SINENSIS 0576
- CAMPANULACEAE 0077 0127 0128
- CANNABIDACEAE 0435
- CANNABINACEAE 0011 0012
- CANNABIS SATIVA 0012 0435
- CAPPARIDACEAE 0274 0442 0582
- CAPPARIS DECIDUA 0274
- CAPRIFOLIACEAE 0388 0599
- CAPSICUM ANNUUM 0066 0088 0109
- CAPSICUM ANNUUM(PATENT) 0649
- CARAGANA CHAMLAGU 0313
- CARICA PAPAYA 0194 0264
- CARICACEAE 0194 0264
- CARTHAMUS TINCTORIUS 0228
- CARUM CARVI 0001 0567
- CARYOPHYLLACEAE 0484
- CARYOPHYLLACEAE(PATENT) 0648
- CASSIA ANGUSTIFOLIA 0043
- CASSIA AURICULATA 0447
- CASSIA GARRETTIANA 0287
- CASSIA GRANDIS 0446
- CASSIA SIAMEA 0253
- CASSIA SPP 0052
- CASSIA TORA 0026
- CASSIMIROA EDULIS 0450
- CASTELA TORTUOSA 0263
- CASTILEJA INTEGRALIS 0400
- CATHARANTHUS ROSEUS 0266 0059 0070 0072 0078
0094 0095 0099 0105 0106 0264
- CAULOPHYLLUM THALICTROIDES 0592
- CEDRONELLA CANARIENSIS 0249
- CELASTRACEAE 0104 0467 0485
- CELASTRUS ANGULATUS 0467 0485
- CELASTRUS PANICULATUS 0104
- CENTAURA SOLSTITIALIS 0530
- CENTAUREA CALCITRAPA 0392
- CENTAUREA POBOTII 0392
- CENTELLA ASIATICA 0170 0173
- CEPHALOTAXACEAE 0225 0477
- CEPHALOTAXUS FORTUNEI 0477
- CEPHALOTAXUS SPP 0225
- CERATONIA SILIQUA 0389
- CHELIDONIUM MAJUS 0563
- CHENOPODIACEAE 0061
- CHENOPODIUM ALBUM 0061
- CHENOPODIUM QUINOA 0261
- CHIONANTHUS SPP 0144
- CHONDRODENDRON SPP 0579
- CHRYSANTHEMUM CINERARIIFOLIUM 0045
- CHRYSANTHEMUM INDICUM 0574
- CHRYSANTHEMUM SPP 0052
- CICHORIUM INTYBUS 0121
- CIMCIFUGA RACEMOSA 0605
- CINNAMOMUM CAMPHORA 0402
- CINNAMOMUM ZEYLANICUM 0402
- CISTACEAE 0343 0405
- CITRUS 0117
- CITRUS IYO 0137
- CITRUS LIMON 0499
- CITRUS MEDICA 0203 0264
- CITRUS MINUTA 0380
- CITRUS SINENSIS CV VALENCIA 0498
- CITRUS SPP 0102 0176
- CITRUS UNSHIU 0556
- CLEOME SPINOSA 0582
- CLERODENDRON INERMAE 0264
- CLINOPODIUM CHINENSE 0489
- CLITORIA TERNATEA 0096
- COCCINIA INDICA 0182
- COCCOLOBA UNIFERA 0441
- COCCULUS HIRSUTUS 0094 0276
- COCCULUS PENDULUS 0094
- CODONOPSIS 0127
- CODONOPSIS LANCEOLATA 0128
- CODONOPSIS NERVOSA 0119
- CODONOPSIS PILOSULA 0119 0128
- CODONOPSIS PILOSULA MODESTA 0127
- CODONOPSIS PILOSULA VAR MODESTA 0119 0128
- CODONOPSIS SUBGLOBOSA 0128
- CODONOPSIS SUBSCAPOSUM 0119
- CODONOPSIS TANGSHEN 0127 0128
- CODONOPSIS TUBULOSA 0119
- COLCHICUM AUTUMNALE 0546
- COLLINSONIA CANADENSIS 0361
- COMBRETACEAE 0075 0161 0247 0248 0279
- COMMIPHORA MUKUL 0147 0613
- COMMIPHORA MYHRRRA 0588
- COMMIPHORA OPOBALSAMUM 0588
- COMPANULACEAE 0119
- COMPOSITAE 0016 0026 0045 0052 0076 0166
0176 0181 0202 0228 0242 0265 0272 0275
0277 0295 0296 0312 0318 0331 0343 0354
0380 0392 0396 0405 0406 0415 0438 0439

- 0460 0480 0510 0530 0402 0568 0574 0600
 0607 0003
 CONVULVULACEAE 0147 0173 0215 0264 0368 0411
 CONVULVULUS PLURICAULIS 0147 0173
 COPTIS JAPONICA 0100
 CORIANDRUM SATIVUM 0001
 0239
 CRASSULACEAE 0478
 CRATAEGUS SPP 0125 0144
 CRITHMUM MARITIMUM 0292
 CROTON DRACO 0347
 CRUCIFERAE 0229 0339 0522
 CUCURBITACEAE 0182 0196 0376
 CUMINUM CYMINUM 0001 0243
 CUPRESSACEAE 0385 0436
 CURCUMA AERUGINOSA 0500
 CURCUMA AROMATICA 0500
 CURCUMA DOMESTICA 0500
 CURCUMA HEYNEANA 0500
 CURCUMA LONGA 0020 0038 0040 0336 0352 0553
 0560 0611
 CURCUMA SPP 0185
 CURCUMA XANTHORRHIZA 0397
 0500
 CUSCUTA REFLEXA 0411
 CYCADACEAE 0549
 CYCAS SPP 0549
 CYDONIA OBLONGA 0120
 CYMBOPOGON CITRUS 0203
 CYMBOPOGON FLEXUOSUS 0051
 CYMBOPOGON JWARANCUSA 0126
 CYMBOPOGON MARTINII 0051
 CYMBOPOGON WINTERIANUS 0051
 CYMINUM CUMINUM 0030
 CYNANCHUM HANCOCKIANUM 0373
 CYPERACEAE 0573
 CYPERUS SPP 0573
 DATURA STRAMONIUM 0049
 DELONIX REGIA 0260
 DELPHINIUM AJACIS 0423
 DELPHINIUM DENUDATUM 0114
 DELPHINIUM LEROYL 0288
 DELPHINIUM VENULOSUM 0470
 DELPHINIUM ZALIL 0457
 DENDROBIUM ROTUNDATUM 0391
 DENROPHTHOE FALCATA 0535
 DESMODIUM ADSCENDENS 0158
 DICENTRA SPECTABILIS 0369
 DIGITALIS LANATA 0555
 DIGITALIS SPP 0052 0525
 DIOSCOREA SPP 0052
 DIOSCOREACEAE 0052
 DIOSPYROS GREENIWAY 0367
 DIOSPYROS MAFINENSIS 0367
 DIOSPYROS NATALENSIS 0367
 DILOTAXIS TENUIFOLIA 0522
 DRYNARIA FORTUNEI 0210
 EBENACEAE 0367
 ECHINOLOGIA PRAELONGA 0461
 ECLIPTA PROSTRATA 0581
 EHRETIA LAEVIS 0535
 ELAEOCARPACEAE 0427
 ELEPHANTOPUS SCABER 0535
 EMBLICA OFFICINALIS 0041
 ENANTIA CHLORANTHA 0404
 EPHEDRA ALTISSIMA 0530
 EPIMEDIUM SPP 0364
 ERICACEAE 0144 0594
 ESENBECKIA BELIZENCIS 0430
 ESENBECKIA NESIOTICA 0431
 EUCALYPTUS CAMALDULENSIS 0273
 EUCALYPTUS CITRIODORA 0176 0402
 EUCALYPTUS GLOBULUS 0402
 EUCALYPTUS LANCEOLATUS 0264
 EUCLEA NATALENSIS 0367
 EUGENIA CARYOPHYLLATA 0050
 EULOPHIA NUDA 0535
 EUPATORIUM ADENOPHORUM 0272
 EUPHORBIA ESULA 0417
 EUPHORBIA GENICULATA 0123
 EUPHORBIA LATERIFOLIA 0326
 EUPHORBIA NEMATOCYPHA 0316
 EUPHORBIAEAE 0041 0123 0148 0316 0326 0343
 0347 0358 0405 0417 0449 0465 0582
 EURYA TIGANG 0366
 EVODIA MELIAEFOLIA 0337
 EVODIA MERRILLII 0314
 FABACEAE 0028 0473 0593
 FERONIA LIMONIA 0091
 FICUS PUMILA 0177
 FLACOURTIACEAE 0405
 FOENICULUM VULGARE 0001 0222
 FORSYTHIA EUROPAEA 0414
 FORSYTHIA GIRALDIANA 0414
 FORSYTHIA INTERMEDICA 0414
 FORSYTHIA JAPONICA 0414
 FORSYTHIA KOREANA 0414
 FORSYTHIA OVATA 0414
 FORSYTHIA SPP 0414
 FORSYTHIA SUSPENSIA 0414
 FORSYTHIA VIRIDISSIMA 0414
 FRAGARIA ANANASSA 0348
 FRAGARIA VESCA 0545
 FRITILLARIA PALLIDIFLORA 0488
 FRITILLARIA PERSICA 0418
 FUNARIA HYGROMETRICA 0241
 GALEOPSIS 0513
 GAULTHERIA PROCUMBENS 0594
 GENTIANACEAE 0387 0652
 GEODORUM DILATLUM 0535
 GERANIACEAE 0189 0422
 GERANIUM NEPALENSE 0189
 GERANIUM ROBERTIANUM 0422
 GERANIUM THUNBERGII 0189
 GLECHOMA HEDERACEA 0174
 GLEHNERIA LITTORALIS 0108
 GLOEOSTEREUM INCARNATUM 0332
 GLORIOSA PLANTII 0036
 GLYCINE MAX 0394
 GLYCOSMIS COCHINCHINENSIS 0214
 GLYCOSMIS PENTAPHYLLA 0214
 GLYCYDENDRON AMAZONICUM 0358
 GLYCYRRHIZA GLABRA 0147
 GLYCYRRHIZA INFLATA 0362 0503
 GLYCYRRHIZA SPP 0052 0144
 GMELINA ARBOREA 0164
 GNETACEAE 0530
 GRAMINEAE 0014 0044 0051 0053 0089 0126 0141
 0168 0203
 GUIZOTIA ABYSSINICA 0016
 GUTTIFERAE 0190 0335 0522
 GYMNEMA SYLVESTRE(PATENT) 0654
 HEDEOMA PULEGIOIDES 0174
 0603

- HEDERA RHOMBEA 0193
 HELICHRYSUM GYMNOCEPHALUM 0402
 HELICHRYSUM SPP 0176
 HELICTERES ISORA 0248
 HELIOTROPIUM EUROPAEUM 0174
 HEPTAPTERA ANTISOPTERA 0284
 HETEROPYXIDACEAE 0479
 HETEROPYXIS NATALENSIS 0479
 HINTONIA LATIFLORA 0398
 HIPPOCASTANACEAE 0258
 HOMALOMENA AROMATICA 0458
 HORDEUM VULGARE VAR NUDUM 0089
 HOSTA VENTRICOSA 0210
 HUMULUS LUPULUS 0011
 HYDRANGEA MACROPHYLLA 0652
 HYDROSTIS SP 0144
 HYOSCYAMUS MUTICUS 0045
 HYOSCYAMUS SPP 0052
 HYPERICACEAE 0010
 HYPERICUM PERFOLIATUM 0522
 HYPERICUM PERFORATUM 0010
 IDIOSPERMACEAE 0301
 IDIOSPERMUM AUSTRALIENSE 0301
 ILEX CRENATA 0363
 IMPATIENS SCABRIDA 0490
 IMPERATA CYLINDRICA 0141
 INULA VISCOSA 0295
 IPOMOEA CORNEA 0264
 IPOMOEA PES-CAPRAE 0215
 IRIDACEAE 0571
 IRIDACEAE 0144 0393
 IRIS MISSOURIENSIS 0393
 IRIS PSEUDACORUS 0393
 IRIS SIBIRICA 0393
 IRIS SPP 0144
 IRIS TECTORUM 0571
 ISATIS INDIGOTICA 0229
 JACARANDA DECURRENS 0267
 JASMINUM GRANDIFLORUM 0440
 JASMINUM SAMBAC 0017
 JATROPHA GOSSYPIIFOLIA 0465
 JUNIPERUS COMMUNIS VAR SAXATILIS 0385
 JUNIPERUS EXCELSA 0250
 JUNIPERUS FOETIDISSIMA 0436
 KAEMPFERIA GALANGA 0483
 KHAYA SENEGALENSIS 0208
 KIGELIA SPP 0234
 KOANOPHYLLON ALBICAULE 0439
 LABIATAE 0045 0047 0052 0064 0080 0084 0118
 0139 0141 0173 0174 0184 0233 0249 0264
 0285 0311 0317 0319 0327 0330 0343 0361
 0429 0433 0443 0469 0471
 0474 0487 0489 0492 0513 0058 0558 0402 0567
 0586 0595 0603
 LABIATAEVIRIDIS LAVANDULIODORA 0025
 LACTUCA VIROSA 0181
 LAMIACEAE 0291 0136 0210 0305 0306 0468 0512
 0535
 LAMIOPHLOMIS ROTATA 0492
 LAMNEA GRANDIS 0535
 LANTANA CAMARA 0264
 LARDIZABALACEAE 0351
 LAURACEAE 0224 0255 0334 0370 0402 0609
 LAURUS NOBILIS 0255 0334
 LAVANDULA ANGUSTIFOLIA 0586
 LAVANDULA FRAGRANS 0586
 LAVANDULA LATIFOLIA 0586
 LAVANDULA OFFICINALIS 0586
 LAVANDULA SPP 0558
 LAWSONIA ALBA 0264
 LECYTHIDACEAE 0395
 LEGUMINOSAE 0004 0010 0026 0029 0043 0052
 0087 0093 0096 0107 0144 0147 0158 0159
 0197 0226 0253 0259 0260 0268 0287 0313
 0323 0356 0362 0389 0394 0401 0405 0446
 0447 0451 0459 0475 0503 0588 0613 0644
 LEONOTIS NEPETAEFOLIA 0535
 LEPECHINIA CAULESCENS 0319
 LEPIDIUM MENZIELI 0582
 LESPEDEZA FORMOSA 0356
 LIATRIS PUNCTATA 0400
 LIGULARIA SAGITTA 0354
 LIGUSTICUM CHUANXIONG 0210
 LILIACEAE 0036 0046 0068 0082 0111 0230 0262
 0322 0338 0355 0377 0384 0399 0418 0452
 0488 0546 0560 0596 0617 0652
 LILIACEAE(PATENT) 0650
 LIMONIA ACIDISSIMA 0482
 LINARIA JAPONICA 0419
 LITHOSPERMUM ERYTHRORHIZON 0219
 LITSEA CUBEBA 0224
 LOBELIA INFLATA 0077
 LOGANIACEAE 0333 0579
 LOLIUM PERENNE 0120
 LOPHIRA ALATA 0463
 LOPHOPHORA WILLIAMSII 0634
 LORANTHACEAE 0248 0535
 LORANTHUS PARASITICUS 0248
 LUPINUS ANGUSTIFOLIUS CV UNIHARVEST 0197
 LUVUNGA ANGUSTIFOLIA 0482
 LYCIUM BARBARUM 0110
 LYCOPERSICON LYCOPERSICUM 0174
 LYCOPUS LUCIDUS 0443
 LYGOS RAETAM 0268
 LYTHRACEAE 0247 0248 0264
 MADHUCA BUTYRACEA 0412
 MAGNOLIA ACUMINATA 0365
 MAGNOLIA FARGESII 0408
 MAGNOLIACEAE 0365 0408
 MALACHRA CAPITATA 0026
 MALVACEAE 0120 0026 0315
 MANGIFERA SYLVATICA 0283
 MARRUBIUM 0513
 MARRUBIUM ALYSSON 0306
 MATRICARIA RECUTITA 0568
 MECARDONIA PROCUMBENS 0535
 MEDICAGO SATIVA 0394
 MELALEUCA CORDATA 0303
 MELALEUCA HALMATURORUM SUBSP CYMBIFOLIA 0303
 MELALEUCA INCANA 0303
 MELALEUCA LANCEOLATA SUBSP PLANIFOLIA 0303
 MELALEUCA LEUCADENDRON 0371
 MELALEUCA RHAPHIOPHYLLA 0303
 MELALEUCA SHEATHIANA SUBSP SHEATHIANA 0303
 MELALEUCA SPP 0176
 MELALEUCA UNICINATA 0303
 MELALEUCA VIRIDIFLORA 0402
 MELANDRIUM FIRMUM 0484
 MELIA AZADIRACHTA (PATENT) 0645
 MELIA AZEDARACH 0293
 MELIA SPP 0217
 MELIACEAE 0013 0023 0092 0132 0160 0179 0186
 0208 0217 0247 0293 0542
 MELIACEAE(PATENT) 0645

- MELILOTUS ALBA 0451
 MENISPERMACEAE 0094 0276 0286 0405 0444 0579
 MENTHA 0025
 MENTHA ARVENSIS 0064
 MENTHA PIPERITA 0045
 MENTHA PULEGIUM 0603
 MENTHA SPICATA 0567
 MENTHA SPP 0052
 MERULIACEAE 0332
 MIKANIA CORDATA 0166
 MIMOSACEAE 0405
 MIRABILIS JALAPA 0246
 MONARDA PUNCTATA 0174
 MONNINA SYLVATICA 0235
 MORACEAE 0177
 MORINDA CITRIFOLIA 0532
 MORINDA PARVIFLORA 0532
 MORINDA RETICULATA 0532
 MORINDA ROYOE 0532
 MORINGA OLEIFERA 0055 0169
 MORINGA PTERYGOSPERMA 0098
 MORINGACEAE 0055 0098 0169
 MUCUNA ATROPURPUREA 0093
 MUCUNA HIRSUTA 0093
 MUSA PARADISIACA 0188
 MUSA PARADISIACA SAPIENTUM 0536
 MUSACEAE 0188 0536
 MUSCARI ARMENIACUM 0338
 MYRISTICA FRAGRANS 0114 0380
 MYRISTICACEAE 0114 0380
 MYRTACEAE 0007 0008 0009 0023 0050 0221 0264
 0302 0303 0371 0403 0481 0521 0535 0402
 NANDINA DOMESTICA 0562
 NARCISSUS TAZETTA 0172
 NARDOSTACHYS JATAMANSI 0173
 NAUCLEA LATIFOLIA 0238
 NEPETA ELLIPTICA 0173
 NEPETA HINDOSTANA 0173
 NERIUM ODORUM 0023 0341
 NICOTIANA TABACUM 0198 0570
 NOTHOPANAX DAVIDII 0493
 NYCTAGINACEAE 0023 0246
 OCHNACEAE 0463
 OCHROSIA ELLIPTICA 0094
 OCIMUM BASILICUM 0291
 OCIMUM CANUM 0118
 OCIMUM GRATISSIMUM 0118 0402
 OCIMUM SANCTUM 0118 0264
 OLDENLANDIA NUDICAUTIS 0535
 OLEACEAE 0017 0144 0414 0440
 ONONIS ARVENSIS 0107
 ONOSMA BRACTEATUM 0173
 ORCHIDACEAE 0090 0114 0171 0357 0391 0405
 0535
 ORCHIS LATIFOLIA 0114
 ORIGANUM CORDIFOLIUM 0139
 ORIGANUM DICTAMNUS 0174
 ORTHOSIPHON STAMINEUS 0141
 OXALIDACEAE 0535
 OXANDRA ASBECKII 0464
 PANAX GINSENG 0220 0372 0497 0531 0547
 PANAX QUINQUEFOLIUM 0113 0178
 PAPAVER BRACTEATUM 0079
 PAPAVER SOMNIFERUM 0060 0112 0114 0455 0456
 PAPAVERACEAE 0060 0079 0112 0114 0455 0563
 0456 0598 0369
 PARAMURICEIDAE 0461
 PEDALIACEAE 0148 0155
 PEDICULARIS LONGIFLORA 0496
 PELTOPHORUM AFRICANUM 0401
 PERILLA FRUTESCENS 0047 0330
 PERISTERIA ELATA 0357
 PERSEA AMERICANA 0370
 PETERSIANTHUS MACROCARPUS 0395
 PETROSELINUM CRISPUM 0453
 PETTERIA RAMENTACEA 0475
 PEUCEDANUM JAPONICUM 0359 0569
 PHALARIS AQUATICA 0168
 PHASEOLUS VULGARIS 0473
 PHEBALIUM 0509
 PHLOMIS 0513
 PHYSOCHLAINA PRAEALTA 0073
 PHYTOLACCA OCTANDRA 0028
 PHYTOLACCACEAE 0028
 PICEA ABIES 0200 0244
 PICRORHIZA KURROA 0065 0135 0552
 PIMPINELLA ANISUM 0001 0042 0557
 PIMPINELLA SAXIFRAGA 0557
 PINACEAE 0200 0244 0250 0273 0462 0472 0514
 0618
 PINACEAE(PATENT) 0646
 PINELLIA TERNATA 0074
 PINUS 0618
 PINUS PONDEROSA VAR ARIZONA 0514
 PINUS PONDEROSA VAR PANDEROSA 0514
 PINUS PONDEROSA VAR SCOPULORUM 0514
 PINUS SPP(PATENT) 0646
 PIPER BETLE 0251
 PIPER BIOCHIMERIFOLIUM 0383
 PIPER LONGUM 0062
 PIPER LONGUM(PATENT) 0653
 PIPER NIGRUM 0006 0019 0037 0054 0056 0057
 0560
 PIPER RETROFRACTUM 0360
 PIPER TRICHOSTACHYON 0057
 PIPERACEAE 0006 0019 0037 0054 0056 0057 0062
 0251 0360
 0383 0560
 PIPERACEAE(PATENT) 0653
 PITURANTHOS TORTUSUS 0269
 PLANTAGINACEAE 0032 0138 0141 0437
 PLANTAGO ASIATICA 0138
 PLANTAGO DEPRESSA 0138
 PLANTAGO HOSTIFOLIA 0138 0437
 PLANTAGO MAJOR 0141
 PLANTAGO OVATA 0032
 PLEIOSPERMIUM ALATUM 0482
 PLUCHEA ARGUTA 0275
 PLUMBAGINACEAE 0320
 PLUMBAGO INDICA 0320
 PLUMERIA RUBRA VAR IRMA BRYAN 0416
 POACEAE 0120
 PODOCARPACEAE 0245
 PODOCARPUS NAGI 0245
 PODOPHYLLACEAE 0065 0602
 PODOPHYLLUM HEXANDRUM 0065 0602
 PODOPHYLLUM PELTATUM 0602
 POLANISIA DODECANDRA 0442
 POLYGALA JAPONICA 0321
 POLYGALACEAE 0235 0321
 POLYGONACEAE 0122 0240 0441 0604
 POLYGONATUM KINGIANUM 0384
 POLYGONUM EQUISETIFORME 0240
 POLYPODIACEAE 0121 0210 0561

- PONGAMIA PINNATA 0028
 PORTULACACEAE 0405
 PREMNA INTEGRIFOLIA 0164
 PREMNA ODORATA 0420
 PRIADIA GOYAVIA 0402
 PRIMULA VERIS SUBSP MACROCALYX 0307
 PRIMULACEAE 0307
 PRUNUS AMYGDALUS 0176
 PSIDIUM GUAJAVA 0023
 PSORALEA CORYLIFOLIA 0259
 PSORALEA SPP 0087
 PTEROCARPUS MARSUPIUM 0159
 PTEROCAULON PURPURASCENS 0318
 PULICARIA WIGHTIANA 0312
 PULSATILLA SPP 0144
 PUTRANJIVA ROXBURGHII 0582
 PYRROSIA SPP 0561
 RANUNCULACEAE 0018 0100 0114 0144 0206 0288
 0374 0423 0457 0470 0605
 RAUVOLFIA CANESCENS 0031
 RAUVOLFIA SERPENTINA 0031 0081 0101
 RAVENSARA ANISATA 0402
 REHMANNIA GLUTINOSA 0191
 REHMANNIA SPP 0652
 RHAZYA SPP 0289
 RHEUM SPP 0122
 RHINACANTHUS NASUTUS 0535
 RHIZOBIMUM SPP 0096
 RHODIOLA CREMULATA 0478
 RICINUS COMMUNIS 0148
 ROSA ALBA 0304
 ROSA CENTIFOLIA 0304
 ROSA DAMASCENA 0304
 ROSA RUGOSA 0344
 ROSA SPP 0015
 ROSACEAE 0120 0015 0116 0125 0144 0176 0271
 0304 0344 0348 0421 0486 0505 0545 0548
 ROSMARINUS OFFICINALIS 0136 0429
 RUBIACEAE 0204 0238 0256 0343 0409 0532 0535
 RUBUS ACCUMINATUS 0486
 RUBUS ELLIPTICUS 0486
 RUBUS IDAEUS 0421
 RUBUS IDAVA 0548
 RUBUS MULTIBREATUS 0486
 RUMEX CRISPUS 0604
 RUSCUS SPP(PATENT) 0650
 RUTACEAE 0063 0102 0117 0137 0176 0203 0214
 0264 0314 0337 0556 0380 0405 0430 0431
 0450 0482 0498 0499 0509
 SALICACEAE 0187
 SALIX SPP 0187
 SALVIA CANARIENSIS 0080 0311
 SALVIA CANDIDISSIMA 0469
 SALVIA CONFERTIFLORA 0311
 SALVIA DIVARICATA 0471
 SALVIA LAVANDULAEFOLIA 0174 0474 0595
 SALVIA MEXICANA 0311
 SALVIA MICROPHYLLA 0311
 SALVIA MILTIORRHIZA 0184 0210
 SALVIA OFFICINALIS 0136 0474 0595
 SALVIA PARAMILTIOIRRHIZA 0487
 SALVIA SANTOLINIFOLIA 0233
 SALVIA SCLAREA 0474 0058
 SALVIA SOMALIENSIS 0311
 SAMBUCUS CANADENSIS 0599
 SAMBUCUS NIGRA 0599
 SANGUINARIA CANADENSIS 0598
 SANTALACEAE 0071 0609
 SANTALUM ALBUM 0071 0609
 SANTOLINA CHAMAECYPARISSUS 0507
 SAPONARIA OFFICINALIS(PATENT) 0648
 SAPOTACEAE 0412
 SATUREJA PARNASSICA SSP SIPYLEA 0468
 SAUSSUREA LAPP 0065
 SCHEFFLERA IMPRESSA 0454
 SCHIZANDRA CHINENSIS 0069
 SCHIZANDRACEAE 0069
 SCOPOLIA ANOMALA 0282
 SCOPOLIA CARNIOLICA 0282
 SCOPOLIA CAUCASICA 0282
 SCOPOLIA CHINENSIS 0282
 SCOPOLIA LURIDA 0282
 SCOPOLIA SINENSIS 0282
 SCOPOLIA STRAMONIFOLIA 0282
 SCOPOLIA TANGUTICA 0282
 SCROPHULARIACEAE 0052 0065 0135 0191 0400
 0405 0419 0494 0495 0496 0525 0535 0552
 0555 0652
 SCUTELLARIA COLUMNAE 0317
 SENECEO AUREUS 0597
 SENECEO OTHONNIFORMIS 0296
 SENECEO RUWENZORIENSIS 0296
 SERICOSTOMA PAUCIFLORUM 0390
 SESAMUM INDICUM 0148 0155
 SESELI DIFFUSUM 0133
 SIDERITIS 0513
 SIDERITIS PAULI 0305
 SIMAROBACEAE 0263
 SIPHONOSTEGIA CHINENSIS 0494 0495
 SMILAX LEBRUNII 0355
 SOLANACEAE 0027 0045 0049 0052 0066 0073
 0088 0097 0109 0110 0174 0198 0282 0297
 0324 0506 0554 0570 0606 0632
 0649
 SOLANUM DULCAMARA 0174 0606
 SOLANUM SPP 0027 0632
 SOLIDAGO PETRADORIA 0406
 SPHAERANTHUS INDICUS 0432
 STACHYS 0513
 STACHYS ROSEA 0327
 STAUNTONIA HEXAPHYLLA 0351
 STEGANOTAENIA ARALIACEA 0379
 STEPHANIA TETRANTRA 0444
 STERCULIACEAE 0002 0248 0608
 STEVIA REBAUDIANA 0202 0529
 STROBILANTHES CRISPUS 0248
 STRYCHNOS SPP 0579
 SWERTIA ANGUSTIFOLIA 0387
 SWERTIA JAPONICA 0652
 SWIETENIA MAHAGONI 0247
 SYMPHOREMA POLYANDRA 0535
 SYMPHYTUM OFFICINALE 0176
 SYZYGIUM AROMATICUM 0007 0008 0009 0403
 SYZYGIUM CUMINI 0221 0521
 SYZYGIUM JAMBOS 0521
 TABEBUIA CHRYSOTRICHIA 0180
 TABERNAEMONTANA SPP 0289
 TAGETES MINUTA 0380
 TAMARINDUS INDICA 0588
 TANACETUM PARTHENIUM 0591
 TANACETUM VULGARE 0607
 TASMANNIA GLAUCIFOLIA 0103
 TASMANNIA INSIPIDA 0103
 TASMANNIA LANCEOLATA 0103

TERMINALIA BELERICA 0247 0248 0279
 TERMINALIA CHEBULA 0161
 TEUCRIUM CYPRIUM 0285
 THAPSIA MAXIMA 0501
 THEACEAE 0366 0576
 THEOBROMA CACAO 0002 0608
 THEVETIA NERIIFOLIA 0270 0445
 THYMUS CAMPHORATUS 0476 0512
 THYMUS CAPITELLATUS 0512
 THYMUS CARNOSUS 0476
 THYMUS LOSCOSII 0476
 THYMUS LOTOCEPHALUS 0512
 THYMUS MASTIGOPHORUS 0476
 THYMUS VILLOSUS SSP VILLOSUS 0512
 THYMUS ZYGIS SSP ZYGIS 0476
 TINOSPORA MALABARICA 0286
 TITHONIA DIVERSIFOLIA 0438
 TITHONIA ROTUNDIFOLIA 0438
 TRACHELOSPERMUM JASMINOIDES 0177
 TRACHYSpermum AMMI 0001 0133
 TRIBULUS TERRESTRIS 0167
 TRIDAX PROCUMBENS 0331
 TRIFOLIUM REPENS 0028
 TRIFOLIUM SUBTERRANEUM 0010
 TRIGONELLA FOENUM-GRÆCUM 0004 0029 0323
 TRILLIUM ERECTUM 0596
 TRILLIUM GRANDIFLORUM 0596
 UMBELLIFERAE 0001 0030 0042 0048 0083 0108
 0133 0146 0170 0173 0210 0218 0232 0239
 0243 0269 0284 0292 0359 0453 0567 0569
 UNCARIA CALLOPHYLLA 0204
 URGINEA APHYLLA 0377
 UVARIA NARUM 0349
 VALERIANA FAURIEI 0413

VALERIANACEAE 0173 0413
 VANDA ROXBURGHII 0171
 VANILLA PLANIFOLIA 0090
 VAR. NUMMULARIA 0075
 VERATRUM GRANDIFLORUM 0262
 VERBENACEAE 0144 0164 0264 0420 0511 0535
 VETIVERIA ZIZANIOIDES 0014 0044 0053
 VIBURNUM DILATATUM 0388
 VICIA FABA 0459
 VITEX ALTISSIMA 0511
 VITEX NEGUNDO 0511
 VITEX PEDUNCULARIS 0511
 VITEX PINNATA 0511
 VITEX SPP 0144
 VITEX TRIFOLIA 0511
 WALDSTEINIA FRAGARIOIDES 0271
 WITHANIA SOMNIFERA 0297 0506
 WOODFORDIA FLORIBUNDA 0247 0248
 XANTHIUM STRUMARIUM 0026
 XEROMPHIS ULIGINOSA 0409
 XYLOPIA STANDTII 0404
 ZHUMERIA MAJDAE 0433
 ZINGIBER CHRYSANTHUM 0298
 ZINGIBER MIOGA 0378
 ZINGIBER OFFICINALE 0005 0020 0033 0039 0560
 0614
 ZINGIBER SPP 0144
 ZINGIBERACEAE 0005 0020 0033 0038 0039 0040
 0114 0144 0185 0298 0336 0352 0378 0397
 0483 0500 0553 0560 0611 0614
 ZYGADENUS VENENOSUS 0082
 ZYGOPHYLLACEAE 0167 0345 0350
 ZYGOPHYLLUM SIMPLEX 0345

BHATNAGAR LAUREATES 1958-1991

By

SUSHIL KUMAR
T.N. TANDON
N.P. SRIVASTAVA
S.N. GANDHI
S.C. DHAWAN
A. WAHID
D. KUMAR
NISHI BALA
RAMA KUMARI

BHATNAGAR
LAUREATES
1958-1991



Bhatnagar Laureates are the winners of Shanti Swarup Bhatnagar Prize. The most coveted national award for scientists, it can be said to be the Indian Nobel Prize. Instituted by CSIR in 1957 Bhatnagar Prize had been won by 259 scientists and technologists by the year 1991. This book presents the profiles of these winners and highlights their particulars and scientific accomplishments. Scientists, educationists, social scientists and historians of science may find this book highly useful.

Pages: xxiii + 492 Hard bound with dust jacket
Price: Rs.500; US\$ 120; £ 67

Orders should be accompanied by Money Order or Demand Draft made payable to "Publications & Information Directorate" New Delhi and sent to:

Sales & Distribution Officer
Publications & Information Directorate (CSIR)
Dr K.S.Krishnan Marg, New Delhi 110 012



GOLDEN OFFER

You can now buy a complete set of
the attractive popular science titles under the
CSIR GOLDEN JUBILEE SERIES
and also get a FREE GIFT

BODY'S BATTLES

By Bal Phondke

Unfolds the story of the inner defence organisation of the body, the diversity and specificity of its armament and its round the clock vigil that meets every threat to it.

84 pages;
Price: Rs. 15 (Paperback), Rs. 18 (Hardcover)

MINING THE OCEAN

By T K S Murthy

Reveals the timeless secrets of the seas and the secret bounty that they hold in reserve.

106 pages;
Price: Rs. 15 (Paperback), Rs. 20 (Hardcover)

HIS MASTER'S SLAVE

By Tapan Bhattacharya

Tells the non-specialist the riveting story of the modern day genie of the bottle, the PC.

88 page;
Price: Rs. 15 (Paperback), Rs. 18 (Hardcover)

INSIDE STARS

By Biman Basu

Provides a privileged glimpse into star nurseries, tracking the luminescent trail to fiery senescence and death of stars to reveal the mysteries and marvels of cosmic drama.

90 pages;
Price: Rs. 15 (Paperback), Rs. 18 (Hardcover)

PLASTIC FEAST

By Subodh Jawadekar

Celebrates the dawn of the plastics era and elaborates the myriad ways in which plastics touch our lives. A veritable feast of plastics, very palatable to the readers.

96 pages;
Price: Rs. 12 (Paperback), Rs. 20 (Hardcover)

CERAMICS ARE FOREVER

By B C Sharma

Highlights the fascinating versatility of ceramics and provides an excellent close-up of the symbiotic relationship between man and materials.

84 pages;
Price: Rs. 11 (Paperback), Rs. 20 (Hardcover)

ARTIFICIAL INTELLIGENCE

By K D Pavate

Unveils the many facets of artificial intelligence research which would usher in an era of machines for simulating the human mind.

98 Pages;
Price: Rs. 13 (Paperback), Rs. 21 (Hardcover)

MIND MASTER

By Medha Rajadhyaksha

Explores the awesome and puzzling centre of thought, memory and creativity, and unfolds the complex secrets behind the ingenuity and performance of the human brain.

111 Pages;
Price: Rs. 14 (Paperback), Rs. 22 (Hardcover)

MAN IN SPACE

By P Radhakrishnan

Unravels the mysteries of outer space and takes the reader on an odyssey off the beaten path.

79 pages;
Price: 10 (Paperback), Rs. 18 (Hardcover)

HARDY COMPOSITES

By N S K PRASAD

Relates the behind-the-scene details of the versatile class of synthetics that are efficiently replacing conventional materials. It describes the many advantages of the synthetic era which is perhaps at its height today because of the hardy composites.

72 Pages;
Price: Rs. 10 (Paperback), Rs. 18 (Hardcover)

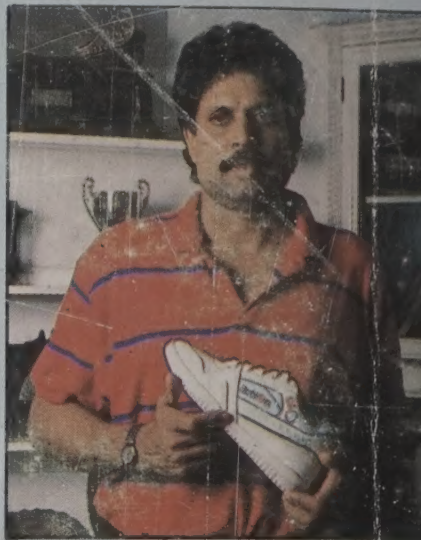
You may place an order for the set by sending Rs. 120* (for Paperback) or Rs. 200 (for Hardcover) including postage by Demand Draft/M.O. payable to "Publications and Information Directorate". A free gift with every order.

For further information write to:

Sales and Distribution Officer
Publications and Information Directorate (CSIR)
Dr. K S Krishnan Marg, New Delhi-110 012

OUR AGENTS: — BANGALORE: Navakarnataka Publications Pvt Ltd, Embassy Centre, 11, Crescent Road, Kumara Park East, Bangalore- 560 001; BHOPAL: Ajay Publishers & Distributors, 74, Motla Park, Behind Moti Masjid, Bhopal-460 001; BOMBAY: Strand Book Stall, Sir Ferozeshah Mehta Road, Fort, Bombay-400 001, Universal Book Corporation, 546, Kalabadevi Road, Dhobi Talao, P B. No.2540, Bombay-400 002; CALCUTTA: Manisha Granthalaya (P) Ltd, 4/3 B, Bankim Chatterjee Street, Calcutta-700 073, MYSORE: People's Book House, J M. Palace Road, Mysore-570 024; NEW DELHI: Sangam Book Depot, 4378/4B, Ansari Road, Darya Ganj, New Delhi-110 002; UBS Publishers Distributors Ltd, 5, Ansari Road, Darya Ganj, New Delhi-110 002; PATNA: Sunil News agency, Yoglatoli, Patna-800 001; PUNE: Satish Book Distributors, 27/B, Siddharth Chambers, Opp. Balwant Chowk, Budhwar Peth, Pune-411 002.

* Valid up to 31 March, 1993



JOURNEY

action[®]
SHOES

A Wide Range of Footwears for Every One!